

# **NAVAL POSTGRADUATE SCHOOL**

## **Monterey, California**



## **THESIS**

**A PERFORMANCE MEASUREMENT APPROACH FOR  
PRICE-BASED ACQUISITION**

by

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December 2000

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**A PERFORMANCE MEASUREMENT APPROACH FOR PRICE-BASED  
ACQUISITION**

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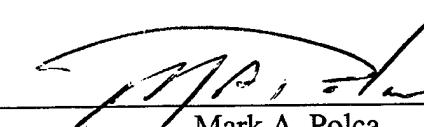
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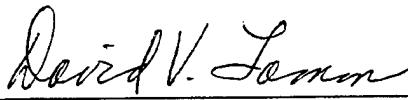
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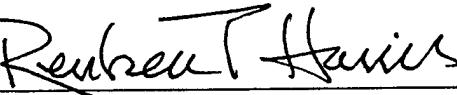
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## **ABSTRACT**

The purpose of this thesis is to create a set of core performance metrics that will be used to evaluate how effective price-based acquisition is in the accomplishment of eliminating or reducing the differences between the Department of Defense's acquisition process and the buying practices of the private sector in the procurement of goods and services. A survey of acquisition professionals at various contracting organizations throughout the Services was conducted to gain an insight into the current understanding and use of price-based acquisition in the contracting process. From the literature review and responses to the survey an analysis was conducted on the current goals, understanding and use of price-based acquisition in the Department of Defense. It was found that the current understanding and use of price-based acquisition is limited in the acquisition process. From the data collected during this research a set of goals and performance metrics were defined for the measurement and evaluation of the primary goals of price-based acquisition.

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## **I. INTRODUCTION**

### **A. AREA OF RESEARCH**

During the last couple of years the Department of Defense has been implementing various acquisition reforms that will eliminate the differences between their acquisition process and the acquisition process of the private sector. One of these reforms is price-based acquisition, which does not use certified cost or pricing data to establish a fair and reasonable price for the goods or services that are being procured. The purpose of this research is to examine and establish a set of core performance metrics that will be used to track and evaluate how effective the use of price-based acquisition is in achieving the goals and objectives as set by the Department of Defense (DoD) acquisition community.

### **B. BACKGROUND**

In Fiscal Year 1998, Section 912(c) of the National Defense Authorization Act directed the Secretary of Defense to submit to Congress an implementation plan to streamline the Defense Department's acquisition process and organization. In response to this directive, DoD initiated a Revolution in Business Affairs. [Ref. 1] A significant part of this revolution is to create a more efficient and effective acquisition environment that will deliver superior weapon systems, materials and services to the warfighter in less time and at a lower cost. As part of the acquisition reform initiative, DoD has been looking for ways to eliminate or reduce the differences between commercial buying practices and DoD's buying practices in obtaining goods and services from the national industrial base. Numerous initiatives are being tried and instituted by DoD. One of these

initiatives is to increase the use of price-based acquisition vice cost-based acquisition. Price-based acquisition is a common approach used by the private sector. Price-based acquisition is the establishment of contractual relationships using price as the principal evaluation factor versus detailed costs. Price may be established by comparisons to prices of other offers, market prices, competitive alternatives and parametric analysis based on price. The premise behind employing price-based acquisition is to reduce the costs associated with procurements of goods and services, reduce the lead time for acquiring materials and services, keep pace with today's rapidly changing technology and tap into the sections of the industrial base that do not currently conduct business with DoD.

### **C. RESEARCH OBJECTIVE**

The purpose of this study is to collect performance measurement criteria that will be useful in developing a set of core performance metrics to evaluate the use and success of price-based acquisition in contracting. It will focus efforts on creating a group of performance metrics to evaluate price-based acquisition in order to improve the effectiveness of this acquisition method. This improved understanding will provide a basis that the acquisition community can utilize to advance the use and effective measurement of price-based acquisition.

### **D. RESEARCH QUESTIONS**

The primary research question is: What principal metrics should be used to evaluate the effectiveness of price-based acquisition and how might these metrics be applied?

The following subsidiary questions were developed to assist in answering the primary question:

- What is price-based acquisition?
- What are the essential elements of price-based acquisition that should be measured?
- Can appropriate metrics for evaluating price-based acquisition be identified?
- How might these metrics be applied to price-based acquisition?
- How might the application of these principal metrics assist in the enhancement of a price-based acquisition strategy?
- Can a set of core performance metrics capture these performance indicators?
- Can metrics be linked to performance improvement outcomes?

#### **E. SCOPE OF THESIS**

The scope of this research provides an understanding of the background surrounding price-based acquisition and a working definition of price-based acquisition. The research then examines the key attributes in developing a set of performance metrics. Next the thesis reviews and evaluates the current understanding of what price-based acquisition is and how the acquisition community is currently using it. Finally, the thesis concludes by recommending a core set of performance metrics for identifying fundamental performance improvements in evaluating the use of price-based acquisition in DoD contracting.

#### **F. RESEARCH METHODOLOGY**

##### **1. Literature Review**

A literature review was conducted using current policies, reports and articles on price-based acquisition. From these reviews, a basic understanding of the current policies

and concerns related to price-based acquisition were developed. Overall there is a consistent call for the use of price-based acquisition as part of acquisition reform.

In addition, a literature review was conducted regarding the current theories and uses of developing and implementing performance metrics to monitor and evaluate business practices and processes.

The research effort also included numerous interviews of acquisition professionals at the policy and working levels of the acquisition community. These interviews were used to define the current thoughts and understanding on the use of price-based acquisition in the DoD procurement process. The combined information found from available written sources and the results of interviews provided the necessary basis for identifying the current use of price-based acquisition in the procurement process. In addition, this information was used to develop a core set of performance metrics that could be used to measure the effectiveness of price-based acquisition in DoD's contracting efforts. Finally, these conclusions formed the basis for recommendations concerning the way the acquisition community could effectively employ and measure price-based acquisition.

## **2. Interview Process**

The basic concept behind this research effort was two fold. First, the researcher wanted to gain an understanding of how various buying organizations viewed and used price-based acquisition as a contracting tool. Second, the researcher wanted to find out if any buying organization had created a set of metrics that looked specifically at the effectiveness of price-based acquisition. The collection of these data was used to

establish a list of possible candidates for creating a set of metrics to measure the performance of price-based acquisition.

*a. Selecting the Contracting Organizations*

A cross-cut section of contracting organizations throughout DoD was picked to establish a good comprehension of the current practices and understanding of price-based acquisition and how contracting organizations were using price-based acquisition as a contracting tool within the DoD. In order to achieve this, it was determined that each of the key contracting organizations in each of the Services and the Defense Logistics Agency (DLA) along with some of the policy makers within the Office of the Secretary of Defense should be contacted about conducting interviews. With the reduction in organizations actually conducting contracting activities the larger contracting organizations in each of the Services was selected as possible candidates. Within the Air Force, the Air Force Materiel Command (AFMC) and several of the Air Logistics Centers (ALCs) were chosen. In the Army, the Army Materiel Command (AMC), the Tank-Automotive and Armaments Command (TACOM) and the Communications Electronics Command (CECOM) were selected. In the Navy, each of the major systems commands Naval Supply Systems Command (NAVSUP), Naval Sea Systems Command (NAVSEA), Naval Air Systems Command (NAVAIR) and Space and Naval Warfare Systems Command (SPAWAR) were contacted along with the Fleet Industrial and Supply Centers (FISC) in Norfolk and San Diego, the Naval Inventory Control Point (NAVICP) and the Naval Regional Contracting Center Detachment London (NRCC Det London). In the Defense Logistics Agency (DLA), the Defense Supply Centers in Columbus (DSCs), Philadelphia and Richmond along with the Defense Contract Audit

Agency (DCAA) was contacted. Each of these organizations was selected in order to try to get a solid overview of how the Services use and define price-based acquisition.

***b. Interview Questions***

Interview questions were divided into two categories: a set of questions for the policy level and a set of questions for the working level. While several of the questions are the same for both levels, the slight difference in wording for the other questions was done to determine the actual use of price-based acquisition within the buying organization at the working level. The questions for the policy level are listed in Appendix B. These questions were used to gather data from the directors and deputy directors of various buying organizations along with members from DoD's policymaking staff and several of the Service level staffs.

The questions developed for the working level are listed in Appendix C. These questions were used to gather data from division heads and contract specialists throughout the various DoD buying organizations that are attempting to implement the policies of price-based acquisition.

One of the other key considerations in developing the questions for the interviews was to keep the time required to answer the questions down to around thirty minutes. This was done in the hopes of getting more people to answer the questions instead of people looking at a set of questions that would be considered too long and tedious to answer.

***c. Acquisition Continuum***

In order to assist in the interview process, an acquisition continuum was developed based on various literature sources. The starting point for the continuum was

taken from the Price-Based Acquisition Report completed in December 1999. [Ref. 2] The report's model was the starting point from which the researcher developed the acquisition continuum that is presented in Appendix D. This acquisition continuum was sent along with the questions to each acquisition professional that agreed to be interviewed. The continuum was designed to act as a common starting point for the interview process. It allowed those people who did not have a strong background in using price-based acquisition to have a reference point from which to draw upon their own personal knowledge of contracting.

### **3. Data Gathering**

Data collection occurred over a three-month period. The researcher generally started the process at each buying organization with the Director of Contracting. From this first contact, a list of potential candidates was gathered for each organization. The researcher then contacted each individual by telephone to explain the nature of the research and to set up a time to conduct the actual interview in person, by telephone or by e-mail depending upon the schedule of the interview. After initial contact was made, an e-mail was sent to each person with a list of the questions and a copy of the acquisition continuum for their review. By sending the list of questions and the acquisition continuum after the initial telephone contact, it allowed the person being interviewed a chance to think about the questions and their answers, especially if the individual was unaware of the recent Price-Based Acquisition Study.

There were two main reasons for the length of the data collection period. First, the end of the fiscal year always poses workload constraints for acquisition personnel. Conducting data collection at the end of the fiscal year meant that everyone was busy

closing out the fiscal year and getting ready for the new fiscal year. The end of the fiscal year workload required a lot of flexibility in setting up times for the interviews.

Second was the nature of the topic. Some of the contracting personnel did not feel that they had a very good working knowledge of the subject material. The knowledge, understanding and use of the price-based acquisition process depended upon what the individuals were buying and how involved their command was in initiating this particular acquisition reform. Despite the extended period over which the interviews were conducted the majority of the people called were very interested in participating in the survey. The biggest problem was in setting up a convenient time during this period to conduct the interviews.

#### **G. LIMITATIONS**

The intent of this thesis is to examine the current understanding and use of price-based acquisition within DoD. From this understanding a set of performance measurements will be developed for each of the selected goals for price-based acquisition. The thesis will not examine the strategic vision of this acquisition reform nor will it apply these metrics to the stated goals and objectives or provide the strategies for implementing the goals or performance metrics.

#### **H. ORGANIZATION**

This thesis consists of six chapters. The second chapter provides a review of the current definitions of price-based acquisition and examines the pricing theory and strategies that companies use in developing the prices for their goods and services. This was followed by an examination of cost analysis and price analysis that is used in price-based acquisition. The last section of this chapter discusses the importance of

establishing sound metrics for measuring the performance and evaluating the goals and objectives of price-based acquisition.

Chapter III presents and reviews the answers to the policy and working level questions collected from the various contracting organizations throughout the Services, the Department of Defense and the Defense Logistics Agency. This information is the core set of data that is analyzed in Chapter IV, which presents the overview of how price-based acquisition is used. The data was also used to establish the proposed list of metrics that are analyzed in Chapter V, which establishes the core set of metrics for evaluating price-based acquisition.

Chapter IV examines and evaluates the information presented in Chapter III collected during the interview process and from the literature research conducted earlier. The analysis conducted in this chapter presents the current understanding and use of price-based acquisition throughout the various contracting organizations that were interviewed during the research process.

Chapter V breaks down the suggested performance measurements from Chapter III and analyzes each of the selected performance measurement data against a list of attributes that was used to narrow the list of the proposed performance metrics. The analyses completed in this chapter determines a core set of performance measurements that can be applied to the stated goals and objectives which can be used to evaluate price-based acquisition.

The final chapter addresses conclusions and recommendations, provides summary answers to the research questions and suggests additional areas for further research in

trying to advance the understanding and use of price-based acquisition in the DoD contracting arena.

## **II. FUNDAMENTALS OF PRICE-BASED ACQUISITION**

### **A. BACKGROUND**

During the last part of the Twentieth Century, the Department of Defense (DoD) found itself in a precarious situation. It was faced with a new adversary within the Government. During the 1990's, DoD was faced with a reduction in the Armed Services along with some drastic reductions in their overall budget authority. The military faced with these constrained resources were forced to defer modernization of their weapon systems. These aging weapon systems quickly started to consume more and more of the Services' budgets to maintain and operate these systems. Dr. Jacques Gansler, Under Secretary of Defense (Acquisition, Technology and Logistics) noted in 1998:

The dilemma we face right now involves competing - and seemingly unlimited – demands for limited resources. We simply cannot afford all that we would like to do – and, on our present path, even all that we must do. With fixed resources, we have resorted to ‘robbing Peter to pay Paul;’ taking from future investments in modernization to maintain current readiness...” Dr. Gansler goes on to note, “Unfortunately, we are trapped in a ‘death spiral.’ The requirement to maintain our aging equipment is costing us much more each year: in repair costs, down time, and maintenance tempo. But we must keep this equipment in repair to maintain readiness. It drains our resources – resources we should be applying to modernization of the traditional systems, development and deployment of the new systems. [Ref. 3]

With these problems facing DoD, they needed to develop acquisition reform initiatives to develop and procure weapon systems and material through new methods. The foundation for acquisition reform was laid in 1994 with the Federal Acquisition Streamlining Act (FASA) and the Clinger-Cohen Act of 1996. In Fiscal Year 1998, Section 912(c) of the National Defense Authorization Act directed the Secretary of Defense to submit to

Congress an implementation plan to streamline the acquisition organizations, workforce and infrastructure. As part of the DoD's acquisition reform, the following was provided by the Secretary of Defense as part of his response to Congress:

In the past, the Department, because of the nature of the marketplace and the fact that in many cases the goods and services the Department purchased were unique, found it necessary to purchase the goods and services it acquired using cost-based contracts built upon the actual or projected cost of an item or service. Both the nature of the Department's requirements and the way in which prices can be determined has changed. Now, DoD is promoting the use of performance-based requirements, which talk of needs in terms of the capability required. In many cases this will permit the Department's needs to be satisfied with commercial products. Where commercial products aren't available, DoD needs can often be satisfied through the use of commercial practices and/or commercial facilities in the provision of services or the production of goods (e.g., producing defense-unique items on commercial production lines using flexible tooling). [Ref. 1]

This response lead to the development of a study team to identify and create processes that allow for valuing goods and services, and for focusing on the price paid, for the value received. [Ref. 1] Many of the changes to the acquisition procedures have been around in one form or another, but there is a need to train the workforce in using the new procedures and to break away from the use of certified cost or pricing data to determine a fair and reasonable price. The whole emphasis of the Revolution in Business Affairs is to eliminate or reduce the differences between DoD's buying practices and commercial firms in procuring goods and services from the industrial base. One of the new concepts emphasizes using price-based acquisition to gain a more commercial acquisition process. Price-based acquisition is a flexible continuum that is used in managing risk and reducing the emphasis on requiring certified cost or pricing data when other methods of determining a fair and reasonable price are available to the procuring organizations.

## **B. PRICE-BASED ACQUISITION**

In order for DoD to continue its Revolution in Business Affairs, it must eliminate or reduce the differences between DoD and commercial firms in obtaining goods and services from the industrial base. [Ref. 2:p. A-1] Price-based acquisition (PBA) is one of the initiatives under DoD's Revolution in Business Affairs to change the way in which DoD procures goods and services. The study that was conducted on price-based acquisition defined PBA as a way for DoD to buy goods and services that does not rely primarily on a supplier providing cost data. [Ref. 2:p. 5] An additional definition of PBA is where a price-based environment is one where market forces and business initiatives determines the price of a product or service, and management is based on performance parameters. [Ref. 4:p. 3] While there are not many definitions of price-based acquisition it should be noted that PBA is really a way of doing business that begins with identifying a requirement and then goes through the entire acquisition process. PBA is heavily dependent on risk mitigation and the acquisition strategy that is aided by competition or alternatives. [Ref. 2:p. ES-3] The idea behind PBA is to transform DoD's current buying practices into ones that are more commercial in nature. PBA is another tool in addition to cost-based acquisition (CBA) that a contracting organization can use in procuring goods and services. Cost-based acquisition is defined as establishing contract prices based completely on a supplier's estimated or incurred costs plus profit. [Ref 2:p. 5] PBA is the establishment of contractual relationships using price instead of certified cost or pricing data. Price can be established by comparing prices of other offerors, market prices and parametric analysis based on prices, rather than certified cost or pricing data from the company. PBA is a process that can be used

in virtually all areas of acquisition from buying simple commercial items to complex weapon systems depending upon the risk associated with each acquisition. There are three objectives that are to be achieved through the use of PBA [Ref. 2:p. 3]:

- To reduce the prices of military products through civil/military business integration and increased efficiency
- To increase access to commercial products, technology and services
- To reduce Government infrastructure

These objectives are consistent with the idea of achieving the best value for the customer in obtaining goods and services. In understanding PBA it must be realized that PBA is on the same continuum as CBA. CBA is a point at one end of the continuum while PBA makes up the rest of the continuum until the other end point where PBA is in its purest form. There are three primary dimensions on the PBA continuum [Ref. 2:p. 5]:

- The degree to which competition exists
- The degree to which technical risk exists
- The degree to which there is confidence that a fair and reasonable price can be determined through means other than by obtaining certified cost or pricing data from the supplier

The following continuum in Figure 2.1 graphically depicts the various parts of the acquisition continuum using price-based acquisition and cost-based acquisition:

As depicted by the continuum, PBA can encompass various elements on the continuum. PBA is an acquisition strategy that should be used during the entire acquisition process. There is no one particular time in which to use price-based acquisition. PBA is a strategy that is based upon the risk of the acquisition. There will be times when there is adequate competition and other times when PBA will be appropriate for a sole source acquisition.

There are two key areas that should be understood when using PBA. The first is determining the level of risk of the acquisition.

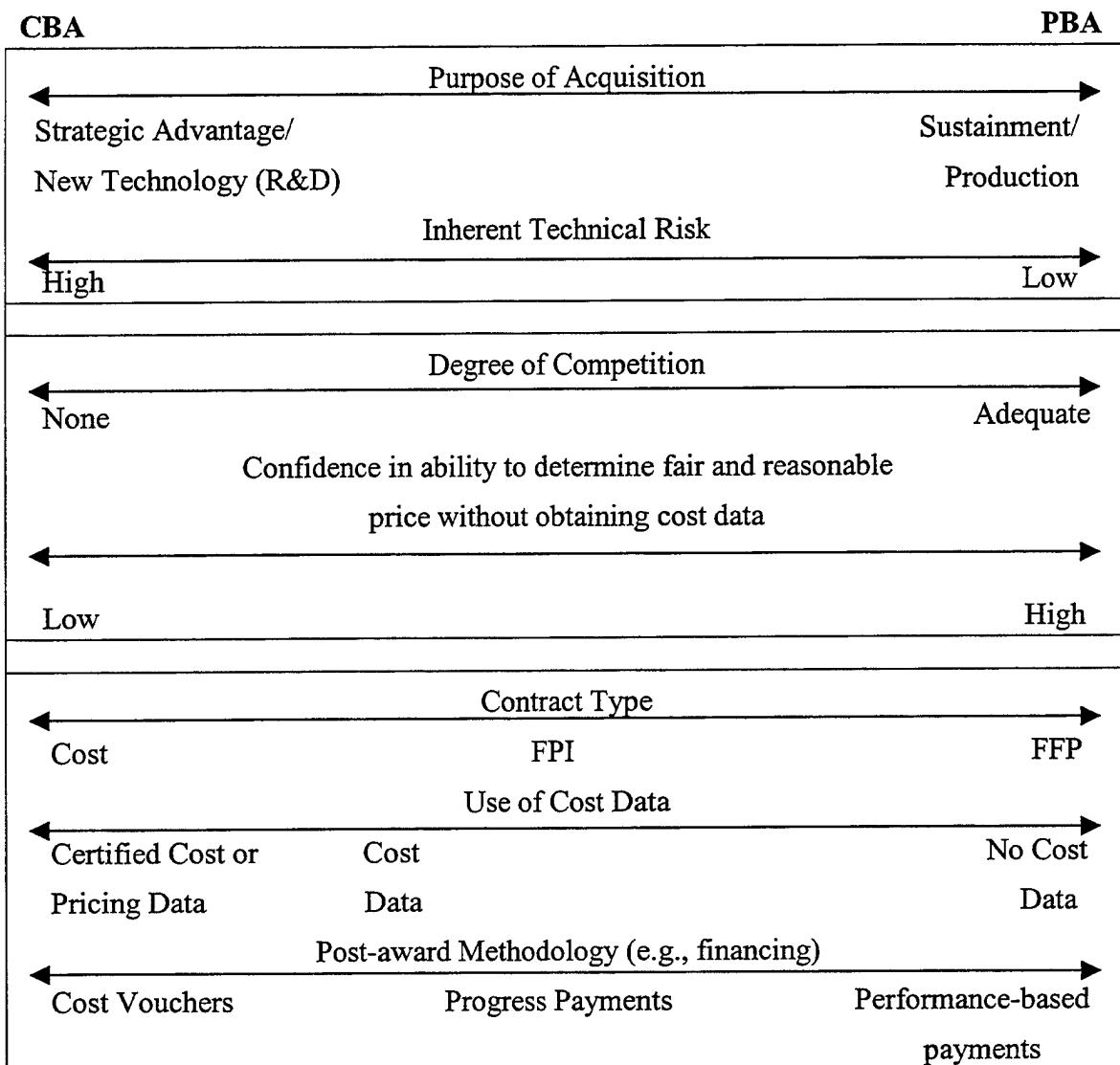


Figure 2.1 The Continuum. [From Ref. 2:p. 9]

If the risk is high and the item being procured is new than it may be better to use CBA. However if the risk level can be mitigated through market research or competition, than PBA could be used to reduce the cycle time of the acquisition. The second area that is important is that the buyer needs to have a strong understanding of the marketplace and

the use of price analysis in order to determine if the Government is paying a fair and reasonable price.

## C. FUNDAMENTALS OF PRICING

An important aspect for any firm competing in the marketplace is how they determine what is an effective price for their product or service. An effective pricing decision is a key hurdle that can help determine whether or not a product is going to be successful in the marketplace. The decisions that go into making the pricing determination for a product must rely upon solid information and facts along with a good understanding of the factors that make-up the marketplace in which the firm is competing. There are several factors that must be examined by a company before it can adequately make its pricing decision. The three areas that must be analyzed by a company are cost, customers and competition.

### 1. Cost Categories

All firms and buyers know that price consists of cost plus profit. With cost being an important part of any price it is key for a firm to understand all of the various cost categories that are involved. The subsets of cost are variable costs and recurring costs, fixed costs, non-recurring costs, semi-variable costs, total costs, direct costs and indirect costs.

#### a. *Variable Costs*

Variable costs or recurring costs are cost elements that vary directly and proportionally with the production quantity of a particular product. [Ref. 5:p. 301] These costs will rise and fall depending upon how much of the company's capacity is

being used to produce their product lines. As a company uses more raw materials in order to produce greater amounts of their products than the company's variable costs will increase. While if a company cuts their production quantities then the company can reduce the amount of raw materials that they require which will shrink their variable costs.

***b. Fixed Costs***

Fixed costs do not vary with volume, but rather change over time. [Ref. 5:p. 301] Fixed costs are those costs that a company must pay regardless of how much they produce. These cost elements have to be paid just because the company is in business. Fixed costs are spread over the company's production quantity. These costs are for items like rent or the cost of their manufacturing equipment that must be paid regardless of how much the company produces. As a company increases production their average fixed costs fall because they are spreading their fixed costs over a larger number of items, while if the company reduces their production quantity then their average fixed costs will rise.

Another type of fixed cost is non-recurring costs, which are those costs that are generally incurred on a one-time basis. [Ref. 6:p. 17.103)] These types of costs are fixed in that they do not vary with volume, but they are generally one-time expenditures for items like special tooling, specialized training or equipment relocation.

***c. Semi-variable Costs***

Unfortunately a company cannot classify all of their costs as either fixed or variable. Many others, termed semi-variable costs, fall somewhere between these extremes. [Ref. 5:p. 301] These types of costs demonstrate aspects of both fixed and

variable costs. Generally they cannot be tied to a specific product line, but will rise and fall depending upon how much a company produces. Examples of semi-variable costs are maintenance and utilities, which are partly variable and partly fixed.

*d. Total Costs*

Total costs are the sum of variable, fixed and semi-variable costs. As a company produces more their total costs will increase. However, the cost to produce each additional unit decreases. This is because the fixed costs do not increase; rather, they are simply spread over a larger number of units of the product. [Ref. 5:p. 302]

*e. Direct Costs*

If a company can specifically trace certain costs to various product lines and operations then these are known as direct costs. These types of costs will vary depending upon how much of an item is produced by a company. Examples of direct costs are direct labor and direct materials. Although most direct costs are variable, it is important to realize that direct costs should not be confused with variable costs; the two terms are rooted in different concepts. Direct costs relate to the traceability of costs to specific operations, while variable costs relate to the behavior of costs as volume fluctuates. [Ref. 5:p. 302]

*f. Indirect Costs (Overhead)*

These costs are associated with or caused by two or more operating activities jointly, but are not directly traceable to either of them individually. [Ref. 5:p. 303] Indirect costs do not allow themselves to be easily traced directly to a product in which to measure how much of the cost is attributable to a single operating activity.

Generally because of the problems and costs associated with attempting to trace indirect costs to a specific product they are assessed as overhead to all of a company's operations. Overall, it is very important for a firm to know what their costs are and the breakdown of those costs in order to make sound pricing decisions of their products.

## **2. The Customer**

Possibly the most important part of these three items is to understand the customer base that makes up the overall market. A firm that is competing in a particular marketplace needs to have an understanding of the values and motivations of the customers to whom they are trying to sell. Consumer behavior is best analyzed in three steps [Ref. 7:p. 62]:

- Consumer preferences are the reasons people might prefer one good to another
- Consumers have limited incomes, which restrict the quantities of goods and services that can be purchased
- Given consumers' preferences and limited incomes, consumers choose to buy combinations of goods and services that maximize their satisfaction

These basic concepts have to be analyzed for each market segment in which a company decides to sell goods and services. Knowing the buying behaviors of the customers that the firm is attempting to reach with their products assists them in determining the pricing strategy to use.

## **3. Competition**

A company that is conducting business needs to know and understand the competition that they will be facing in the marketplace. The competitive forces of the market in which the firm is competing will impact the pricing decisions they are making. Generally in economics there are three types of competition that a firm will face. These

competition types are defined as perfect competition, imperfect competition (oligopoly) and monopoly. A perfectly competitive market is where there are many buyers and sellers for a similar product, so that no single buyer or seller has significant impact upon the market. [Ref. 7:p. 8] In a perfectly competitive market the forces of supply and demand will control the prices of the products. In an imperfect competitive market or oligopolistic market the products may or may not be differentiated and there are only a few firms that account for most or all of the total supply. [Ref 7:p. 429] However even though there are only a few suppliers in this type of market, no one firm has the ability to significantly alter the prices of the products alone. If one firm attempts to increase their prices too dramatically from the other firms in the market than their demand curve will shift with a loss of customers to their competitors. A monopolistic market is one in which one seller controls the entire supply for a market which allows it to maximize its profits by deciding upon output where marginal cost equals marginal revenue. [Ref. 7:p. 329] Figure 2.2 depicts the various levels of competition and the percentage of products that are traded in the United States.

|                                     | Imperfect Competition |             |                                  |  |
|-------------------------------------|-----------------------|-------------|----------------------------------|--|
| Types of Competition                | Monopoly              | Oligopoly   | Differentiated Competition       | Perfect Competition                                |
| Degree of Competition               | One Seller            | Few Sellers | Many sellers of similar products | Very many sellers of similar or identical products |
| Approximate Percent of Transactions | 5                     | 70          |                                  | 25   |

Figure 2.2 Competitive Scale. [From Ref. 5:p. 298]

## **D. PRICING STRATEGIES**

### **1. Seller's Pricing Objectives**

Every firm has a strategy that begins by setting its goals or objectives that they want to accomplish. Whether that goal is to maximize profit or to be the market leader in their respective area each firm has to determine that goal and will attempt to price their goods or services in a way to attain their corporate goals. To the majority of sellers there are two primary pricing objectives [Ref. 8:p. I-6]:

- To cover costs
- To contribute to attaining corporate operational objectives

The first part of this is to cover the costs of conducting business. If a firm is going to remain in business and profitable it must cover its costs over the long run. A firm may occasionally take a loss in an area or on a contract, but in the long run a firm must cover all of its costs if it is to survive.

The second part of a firm's objective deals with their operational objectives, which may be very diverse and may change because of economic conditions or because of a change in their corporate management or perspectives. These objectives serve as benchmarks for their decisions and are clearly defined for their particular set of market decisions, however there are generally several common objectives [Ref. 8:p. I-6]:

- Short-term and/or long-term profitability
- Market share
- Long-term survival
- Product quality
- Technological leadership
- High productivity

Firms that successfully determine their competitive environment will pick pricing strategies that will help them achieve their corporate goals.

## 2. Cost-Based Pricing Strategies

When a company makes the decision to use a cost-based pricing strategy, they are basically concerned with covering all related costs in producing their products for sale. This method is useful to a company that has a good system for tracking and accounting for the actual costs that go into making the product. Figure 2.3 illustrates how producers under a cost-based pricing strategy develop the price for sale to potential customers.

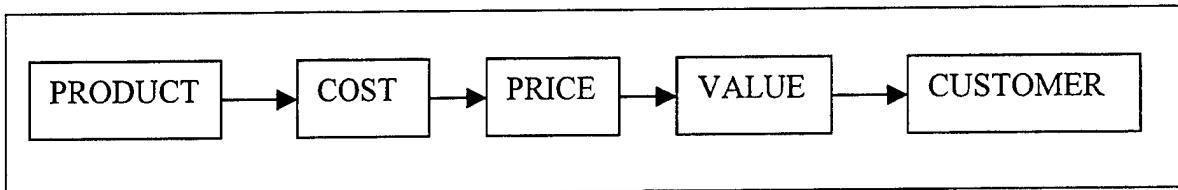


Figure 2.3. Cost-Based Product Pricing. [From Ref. 9:p. 5]

After the company determines the product and establishes the direct and indirect costs associated with the quantity to meet the initial demand the company then determines which cost-based pricing method to apply in establishing the price for its product.

### a. *Mark-up Pricing*

Mark-up pricing is defined as the “establishment of prices based on estimated direct cost or total cost plus a percentage mark-up.” [Ref. 8:p. I-9] The general steps used by a company to determine their mark-up are [Ref. 8:p. I-9]:

- Estimate the sales volume
- Estimate product unit cost at the estimated sales volume
- Determine the mark-up rate to be used

- Calculate unit-selling price by applying the mark-up rate to the product cost

When firms are using mark-up pricing there are several items that a buyer needs to know when dealing with the firm. A buyer needs to take into account the type of market, competitive or monopolistic, that the firm is in and what they are producing. Also a buyer should determine whether the firm is applying the mark-up to direct costs or total costs. If the firm is applying the mark-up percentage to direct costs then the amount must cover the firm's indirect costs plus the profit. If the firm is applying the percentage to total costs then the percentage should be lower than the percentage applied to only direct costs. This type of pricing strategy is found in the automobile industry where prices are established based upon a percentage and this also allows room for negotiation between the buyers and sellers.

*b. Margin Pricing*

Margin pricing is a popular pricing technique that is similar to mark-up pricing because it is also based on a relationship between cost and profit. [Ref. 8:p. I-11] Unlike mark-up pricing where the mark-up is based upon a percentage of cost, margin-pricing uses cost to calculate a price that will provide an established percentage of price. [Ref. 8:p. I-11] The following steps are used to calculate the price based upon the margin [Ref. 8:p. I-11]:

- Estimate the sales volume
- Estimate cost at the estimated sales volume
- Determine the margin rate to be used
- Calculate the selling price by applying the margin rate to the product cost

The margin rates that a company will choose will depend on what type of market they are in, competitive or monopolistic, and what they are producing. An example of where this type of pricing strategy may be employed is in the electronics industry for items like televisions and stereos.

*c. Rate of Return Pricing*

Rate of return pricing has similarities to mark-up pricing in that profit is added to estimate costs, but the rate of return pricing calculates profit based upon the financial investment required to provide the product, the return needed to attract that investment, and the estimated sales volume. [Ref. 8:p. I-13] The following steps are used to determine profit for rate of return pricing [Ref. 8:p. I-13]:

- Determine desired rate of return on investment
- Estimate investment required
- Estimate level of sales
- Estimate unit cost at the projected sales level.
- Calculate desired unit profit.
- Calculate unit-selling price (estimated cost + desired profit)

Generally firms that use rate of return pricing are in competitive markets where movement in their sales volume concerns them because it can directly affect the rate of return on their investment. Industries that use this type of strategy generally have high development costs, which they must cover. Firms that may use this pricing strategy are those involved in the manufacture of drugs and cosmetics.

**3. Market-Based Pricing Strategies**

In using a market-based pricing strategy, a company takes a different view in determining the price for its products. Firms need to develop pricing strategies that accomplish their overall marketing objectives. In developing a market-based pricing

strategy, the company begins their focus on the customer and the perceived value of their product to the customer. Figure 2.4 shows a market-based scenario that begins with an analysis of the customer's needs and the market conditions that will affect the customer's value of the product.

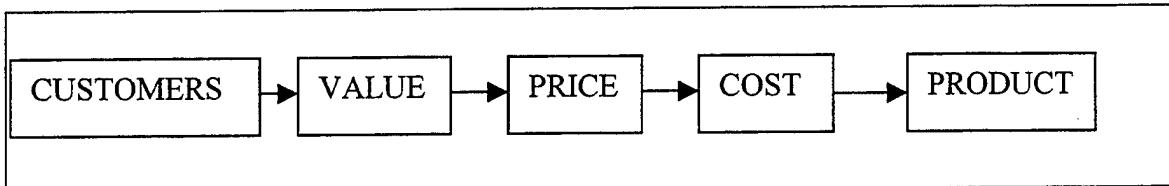


Figure 2.4. Market-Based Product Pricing. [From Ref. 9:p. 5]

After the market conditions and the potential customer base have been analyzed the company will determine a price that best fits the value that the customers will place upon their product. The direct and indirect costs associated with the product are then determined and if the projected pricing strategy satisfies the firm's profit objectives then the product is placed out in the market.

*a. Profit Maximizing Pricing*

The key purpose for any firm in business is to maximize the value to the company's shareholders. In order for a company to maximize its value, it must make a profit in the long run. If a firm does not make a reasonable profit then the company will eventually go out of business and its investors will look elsewhere to invest their money in order to get a satisfactory return on their investment. It is important that a company makes a profit in order to attract investors so that they can gain the necessary capital to expand and improve the company. One of the strategies that a company will take in pricing their products is to maximize profits. In profit maximizing pricing, the company assumes that demand falls as prices increase and grows as prices decrease. [Ref. 8:p. I-

16] So a firm that is using this method must understand the economic relationship of supply and demand. This is especially important when the market the company is in is demand sensitive to price changes. This strategy is effective when price is important in determining demand for the product and when a firm's competitors are slow to react to a change in price. [Ref. 8:p. I-16] This strategy is not very effective when competitors react quickly to changes in price because the firm changing the price does not have enough time to get the new quantity to market quick enough. [Ref. 8:p. I-16] The company must determine what is the optimal combination of price and quantity of its products in order to achieve the highest profit for the firm. The Government's Contract Pricing Reference Guide provides a couple of good strategy implications for buyers [Ref. 8:p. I-16],

In Government contracting, the purchase quantity estimates are generally fixed, based on the needs of the Government. No matter how low the offeror's price, the quantity acquired by the Government does not change. Thus there is no advantage to the offeror to offer a price lower than that necessary to win the contract. Prices for multiple awards or for inventory items, which vary from period to period, can be influenced by changes in prices.

This pricing strategy is effective when a change in price can influence a customer's demanded quantity. This strategy will come into play more often for organizations buying replacement parts, especially those that are commercial in nature.

**b. Market Share Pricing**

The strategy of market share pricing is based upon the assumption that long run profitability for a company is based upon market share. [Ref. 8:p. I-17] The whole premise behind this strategy is that a firm applying this method is seeking to capture an increased or majority of the market share. The goal of the firm is to control

the market until the firm can increase its profit through economies of scale or by raising their price at a later date. The airline industry uses this pricing strategy in order to gain control of air travel routes and hubs so that they can later increase their fares and increase their profits. One of the main concerns for a buyer is that a company is attempting to “buy-in” with a low initial price that may jeopardize contract performance if they cannot cover costs or recoup their losses through changes to the contract. [Ref. 8:p. I-17] This strategy can be limited by the make-up and competition of the market that a company is in.

*c. Market Skimming*

Market skimming sets prices to achieve a high profit on each unit by selling to the buyers in the marketplace who are willing to pay a higher price for a product of perceived higher value. [Ref. 8:p. I-18] This type of pricing strategy generally occurs when customers are willing to pay a premium price for the latest technology or unique items. Generally this type of strategy is effective when there is only a sole source provider or a limited number of competitors that are able to supply a unique product. Normally this model is used when there are barriers to entry for other firms to provide a similar good. However these barriers will eventually diminish which will allow new firms to enter the market. Firms using this method will generally establish a high price to achieve a high profit margin with a low volume and then will drop their price over time to attract new buyers when similar products enter the market. [Ref. 8:p. I-18] The computer hardware and software industries use this pricing strategy when they come out with new products. A buyer must determine if the premium price for a product is the best value to their organization. A buyer needs to examine what the

item is being used for because the intended use may allow for the use of a similar product at a lower price. [Ref. 8:p. I-18]

*d. Current Revenue Pricing*

Firms who have placed the emphasis on maximizing their current revenue stream rather than looking to maintain a long-term revenue stream use this method. [Ref. 8:p. I-19] Companies using this method are generally new to the market and have yet to establish their financial stability. By using this strategy the firm hopes to maximize their cash flow and maintain their market presence for the short term. The uncertainty of a potential long-term market would also cause a firm to take up this pricing method. This type of strategy is used by toy manufacturers who believe a particular product may have a short, but robust market life before another fad becomes popular. This is another strategy where a firm needs to understand the relationship between supply and demand so that they can determine the best combination of quantity and price to maximize their profits. For the buyer, this type of strategy has the potential for high risk because many firms using this method have limited financial resources.

*e. Promotional Pricing*

In using promotional pricing, firms price products to enhance the sales of the overall product line rather than price each individual product to ensure that it is profitable. [Ref. 8:p. I-20] Promotional pricing is a short-term approach that attempts to achieve profit motives through other means. This type of pricing method is generally used by retail markets for items like electronics or groceries, but can be used in any situation where there are multiple products or services being bundled under one

agreement. There are generally three main types of promotional contracting [Ref. 8:p. I-20]:

- Bait and switch pricing can be particularly attractive to a firm preparing an offer for a delivery order contract with multiple line items. An offeror uses a low price on one product and then attempts to switch to a higher price during the negotiations
- Loss-leader can be attractive in situations where many items are commonly bought from the same source. An offeror using this strategy reduces the price of one or a group, to near or below cost. Then they sell related products at higher prices
- Prestige pricing uses a high-quality, high priced item to enhance the image of an entire product line and attract more buyers

Companies planning on using this method must determine if selling a product at a loss will increase the sales of other products or whether selling a product at an increased price will improve the perception of the product line.

*f. Demand Differential Pricing*

The strategy of demand differential pricing prices products or services in different market segments in a way that is not consistent with the marginal costs related to the different segments. [Ref. 8:p. I-21] The goal behind this method is to tailor sales in the different segments to match the different demands in that segment. This strategy may employ several other pricing strategies in each segment. When a company is tailoring this method for each segment they identify the different factors that will affect the pricing of the product. Some areas that a firm may look at are the customer make-up, the geographical area, demand intensity in each area, competitors and the time. [Ref. 8:p. I-21] The challenge in using this method is to effectively identify the unique particulars of each market segment. The cosmetics industry can employ this pricing strategy for

different products like suntan lotion where they can charge a higher price in warm sunny areas.

**g. *Market Competition Pricing***

In market competition pricing, the firms in that particular market will set their prices in relation to their competitor's actual prices or anticipated prices. [Ref. 8:p. I-22] This method is generally used when the market is homogenous and there is only a limited way in which to distinguish between products. This type of pricing strategy is used where sellers are price takers like the agriculture industry because there is very little difference, if any, between the products. For a company to be successful using this method, they must tightly control their costs and accurately predict the movement of the market so they can move along with the market while still keeping their prices above their costs.

**E. COST ANALYSIS VERSUS PRICE ANALYSIS**

**1. Cost Analysis**

Cost analysis is the evaluation of separate cost elements and profit in a proposal to determine how well the proposed cost elements represent what the cost of the contract should be based upon the judgment of the evaluator with the assumption of a reasonable economy and efficiency. [Ref. 10:p. 275] The Government uses cost analysis to determine if an offeror's proposal provides a fair and reasonable price. Cost analysis is used to determine the reasonableness of the separate cost elements generally not the overall price of the proposal. A cost is considered reasonable if it does not exceed the cost that would be incurred by a prudent businessperson in the conduct of a competitive business during normal operations. [Ref. 11:p. 1-7] The other aspect of the cost analysis

is to determine that the associated costs of the proposal are realistic for the work to be performed under the contract. Cost realism has three basic elements that should be accounted for in an offeror's proposal [Ref. 11:p. 1-7]:

- Realistic for the work to be performed under the contract
- Reflect a clear understanding of contract requirements
- Consistent with the various elements of the offeror's technical proposal

Cost analysis should provide the Government an insight into what it will cost the contractor to complete the contract. However cost analysis does not take in account what the market is willing to pay for the product involved, for this the Government must conduct price analysis.

## **2. Price Analysis**

Price analysis is taking a proposal and evaluating the proposed price without evaluating the individual cost elements and proposed profit. [Ref. 10:p. 280] Price analysis should be used as a follow-on process after the cost analysis to determine the overall price reasonableness of the proposal or it can be used by itself to determine if the proposed price is fair and reasonable if there is only an analysis of the price itself without the breakdown of the individual cost elements. In conducting a price analysis of a proposal the Government has several different methods that they can employ to conduct the price analysis [Ref. 10:p. 280]:

- Comparison of proposed prices received in response to the solicitation
- Comparison of previously proposed prices and contract prices with current proposed prices for the same or similar end items, if both the validity of the comparison and the reasonableness of the previous price(s) can be established

- Use of parametric estimating methods/application of rough yardsticks (such as dollars per pound or per horsepower, or other units) to highlight significant inconsistencies that warrant additional pricing inquiry
- Comparison with competitive published price lists, published market prices of commodities, similar indexes, and discount or rebate arrangements
- Comparison of proposed prices with independent Government cost estimates
- Comparison of proposed prices with prices obtained through market research for the same or similar items

The process of conducting the price analysis of a proposal requires that the proposed price is compared and evaluated against some other similar price to determine that the proposed price is fair and reasonable. The proposed price is compared to a base price that is a price that the contracting organization believes is a reasonable estimate of the price that should be paid for the product, which is known as the “should pay” price. [Ref. 10:p. 280] This analysis allows the contracting organization to take into other considerations like urgency, need and the market forces vice just evaluating the proposal on the actual cost elements.

## **F. INTRODUCTION TO PERFORMANCE MEASUREMENT**

In order to achieve the goals of an acquisition reform such as price-based acquisition, there needs to be a process that begins with defining the strategic vision of the initiative. Once a strategic vision is in place, a set of achievable goals must be defined. With the vision and goals in place, a set of performance metrics must be found for each of the goals that will monitor and measure the effectiveness of the efforts that are striving to achieve each of the goals. These performance measurements each need to have an objective that the workforce can strive to attain that will move the organization

towards the achievement of the stated goals. Finally, from this set of performance metrics the strategies to implement the goals can be created to guide the contracting organization in its efforts. The model that will be used is depicted in Figure 5.1.

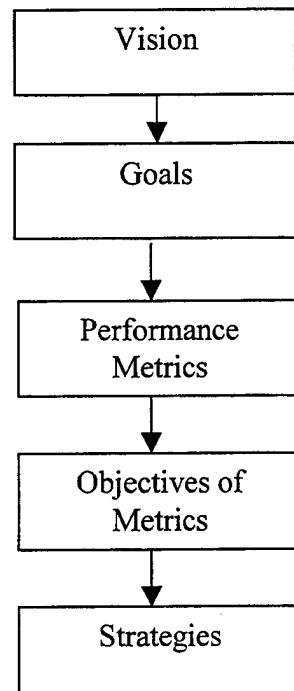


Figure 2.5. Strategic Measurement Model. [From Ref. 12:p. 11]

### 1. Strategic Vision

This model starts with defining the strategic vision that will provide the overarching framework for price-based acquisition. A strategic vision is a roadmap of an organization's future direction, position and capabilities that it intends to develop. [Ref. 13:p. 5] Strategic vision is often already defined before it gets down to the Services and the working level that will be responsible for implementing acquisition reform. That is the case with price-based acquisition. Price-based acquisition is part of the Revolution in Business Affairs in which DoD wants to eliminate or reduce the differences between

DoD and commercial procurement practices in obtaining goods and services from the national industrial base. [Ref. 3:p. A-1] With the strategic vision defined, a set of goals must be created that are to be achieved through the use of this reform.

## **2. Goals**

The identification of the goals is the next step in this process. A goal is the purpose toward which an endeavor is directed. [Ref. 14] The goals that are chosen for an acquisition reform like price-based acquisition should be measurable and achievable. They should be goals for which the organization will strive, but if they are unattainable the organization may not even attempt to try to achieve them. Also, the goals should be reasonable in that the majority of the workforce agrees that these goals are worth achieving. However, a problem can arise in determining a common set of goals for an acquisition reform that is to be implemented by a large group of organizations. Once a set of goals is decided upon, the performance metrics need to be identified and matched to each of the goals.

## **3. Performance Metrics**

### **a. *Introduction***

In today's environment of intense competition and dwindling resources, organizations have to conduct their business better and faster with less. One of the key abilities of successful organizations is being able to measure performance and use that information to achieve the organization's strategy. By creating metrics, individuals gain a deeper understanding of their organization and the process that they are attempting to measure. The Federal Government is no different in this matter. In 1993, Congress

enacted the Government Performance and Results Act (GPRA) to improve the public's confidence in the ability of the Federal Government to account for the use of public funds and achieve viable program results. GPRA directs all of the Federal Agencies to develop strategic plans which include outcome related goals and objectives. Further the Act directs the establishment of performance indicators or measurements to be used in monitoring and assessing the relevant goals and strategies of each agency. [Ref. 15:p. 115] Not only is it now required for Government agencies to develop and use performance measurements, it makes good business sense to use metrics to enhance their support to their customers.

In order for contracting organizations to gauge if new acquisition reform initiatives like price-based acquisition are useful to them, they must be able to measure the outcomes of contracting actions using price-based acquisition. These performance measurements must be tracked and monitored by all contracting organizations within DoD against the goals and objectives of PBA. The main considerations and objectives set for the use of price-based acquisition by DoD are [Ref. 3:p. 3]:

- To reduce the prices of military products through civil/military business integration and increase efficiency
- To increase access to commercial products, technology, and services
- To reduce Government infrastructure

While establishing a set of metrics to measure these goals will be difficult to create, the establishment of these performance measurements is required to determine if the use of price-based acquisition is accomplishing the goals of acquisition reform through the use of more commercial acquisition processes.

*b. Keys to Good Performance Metrics*

“You can’t improve what you can’t (or don’t) measure.” [Ref. 16:p. 1]

Metrics are nothing more than a standard measure to assess your performance in a particular area so that you can focus your activity on continuous improvement. When developing metrics for an agency or for just a branch within the agency there are several things to consider. [Ref. 12:p. 3]

- Fewer are better: Concentrate on measuring the vital few key variables rather than the trivial many
- Measures should be linked to the factors needed for success: key business drivers
- Measures should be a mix of past, present, and future to ensure that the organization is concerned with all three perspectives
- Measures should be based around the needs of customers and other key stakeholders
- Measures should start at the top and flow down to all levels of employees in the organization
- Multiple indices can be combined into a single index to give a better overall assessment of performance
- Measures should be changed or at least adjusted as the environment and your strategy changes
- Measures need to have targets or goals established that are based on research rather than arbitrary numbers

*c. Types of Performance Metrics*

Metrics can be divided up into several different categories depending upon what is being measured and the goal the metric is trying to accomplish. Metrics are generally categorized up into baseline metrics, trending metrics, control metrics and diagnostic metrics.

(1) Baseline Performance Metrics. The baseline measurements are the key metrics when first starting out in developing a set of metrics. [Ref. 16:p. 10] They establish the starting point from which to measure the current performance of an activity. It is from this point that you begin establishing the measurement system that you want to assess and improve. Establishing the baseline measurement will be one of the harder areas to measure, but without it one cannot determine if improvement is occurring.

(2) Trending Performance Metrics. A trending metric allows the organization to see how something is doing over a designated period of time. [Ref. 16:p. 12] The new data that are collected are compared to the baseline to determine whether the activity is improving or declining.

(3) Control Performance Metrics. A control performance metric measures whether or not an activity is staying within a set of predetermined bounds set up by the organization. [Ref. 16:p. 13] This type of metric is generally used to give feedback to the activity. If a measurement point goes outside of the determined bounds, that the organization can monitor that particular activity to see if the point is a one-time occurrence or if a trend is starting to develop.

(4) Diagnostic Performance Metrics. Diagnostic metrics help answer questions when a metric begins to trend in the opposite direction of the desired result. [Ref. 16:p.15] Diagnostic metrics help determine why a specific metric is causing an undesirable outcome. These metrics attempt to point the user to a specific problem by measuring the parts that make up the larger performance measurement. Diagnostic measures can be made up of trend and control measures because they can have the ability

to point out a problem and help an organization track down the reason for the change in the metric.

By using these four types of metrics in conjunction with each other to measure the effects of an organization's strategy it allows the organization to review the past assumptions and then plan the future goals and strategy of the organization.

*d. Collecting and Distributing Metrics*

When developing a metric or set of metrics there are four basic questions that should be asked [Ref. 16:p. 45]:

- Who?
- What?
- When?
- How?

By answering these four basic questions, one will be much closer to creating a metric that is going to be used effectively.

The “Who” question refers to who will actually use the collected metric information. If an organization or an individual can't actually be linked to a specific metric, then that particular metric is probably not being used because no one uses these data or the group that uses these data is not receiving it. It is very important that an actual name is identified and linked to each metric that an organization is using. There are too many times that information is sent to a group or individual who is assigned to merely collect and assemble the gathered data. This group then distributes the metrics. If there is no particular person associated with each metric then that metric should be examined very closely to see if there is any value added. [Ref. 16:p. 46]

The “What” question is used to identify the specific types of metrics to collect.

The “When” question deals with both the frequency of when the data are collected and when the measurement performance data are distributed to the users. [Ref. 16:p. 46] Some data need to be collected almost on a continuous basis while other data may only need to be collected on a monthly basis. In determining when data should be collected, it is important to understand the timeframe in which the collected data are useful. Some data may only have value to the user for a specific amount of time. Other data may be more useful in a historical context to display trends and patterns. Generally, the closer the user is to the actual work of the organization, the more important it is for that person to get time related information. [Ref. 16:p. 47] Upper level managers don’t generally require near real time information, but generally use metric data to examine historical trends and overall performance. [Ref. 16:p. 48]

The “How” question refers to how the specific data are to be collected, distributed and displayed to the intended user. [Ref. 16:p. 49]

*e. Displaying Metrics*

It is important that the results from the data collection be displayed in an easily read format that the user can readily interpret to get the information they need to do their job and achieve the stated goals of the organization. In order for metrics to be useful to an individual, management and the organization as a whole, the metrics that are being monitored must be displayed in a format that is consistent, simple, understandable and readable. [Ref. 16:p. 58] The metrics that are being presented must give the intended user relevant information that can be easily used to monitor and assess whether

the organization is headed in the right direction. There are several basic concepts when determining how to display the metric data that have been collected.

First, keep it simple. In displaying the performance measurements, it is better not to clutter up the charts with unnecessary details or pictures that do not add any pertinent meaning. Second the display should be arranged to quickly provide all the critical information needed for the user to determine if the data are tracking to the desired outcome or if they are starting to trend in the opposite direction. [Ref. 16:p. 56] Third, ensure the data are presented in a meaningful and ready-to-use format. Requiring the user to manipulate or convert the data detracts from its usefulness. [Ref. 16:p. 56] If the user has to take the time to convert data so that they are useful to them, eventually they will start filing the reports in a drawer and never use the data that are being collected to manage their respective area. Once this happens, collection of the metric data just becomes an exercise in collecting and storing useless information. Fourth, associate the collected data with the goal that is attempting to be attained. [Ref. 16:p. 56] By placing the goal alongside the data, whether it is a number or a line that the data are tracking, it provides the user with an easy snapshot of how the performance of the organization is progressing towards achieving the stated goals. Finally, the charts or displays should only be modified to provide a clearer, cleaner picture for the user. The user will want to look at the same positions on the displays to get the same performance measurement as the last report. If the reports are constantly changing and being modified merely for display purposes, the user may get frustrated with the reports and eventually ignore them.

*f. Evaluating Metrics*

In order to ensure the metrics that are developed by an organization are useful, there are several tests that should be used so that they achieve the objectives of the organization. The first item to remember is that measurement drives behavior. [Ref. 16:p. 67] The purpose of a metric is to drive the desired behavior. Unfortunately, sometimes a metric can drive a behavior that is not what was intended or desired. Developing poor measures that can easily be manipulated can lead to unwanted performance outcomes. For example, holding team meetings for no real purpose except to satisfy a metric that tracks the number of meetings being held, provides no real value to the organization. [Ref. 16:p. 67]

For a metric to be effective it should measure real work outputs and accomplishments or those in-process factors that affect work outputs and accomplishments. [Ref. 16:p. 67] It is always better if a metric can be tied to an output that can be consistently measured.

Performance measurement systems cost an organization time and money to develop and maintain. [Ref. 16:p. 68] This is why it is important for an organization developing a set of metrics to concentrate on only those metrics that help in achieving the desired outcomes and goals. It can be very costly for an organization to get caught up in creating metrics for everything that is going on. If too many metrics are being used by an organization, the performance measurement system becomes just an exercise in data collection and the usefulness of metrics to improve the organization's processes are lost.

A good test for an organization is to take their set of metrics and tie a specific performance measurement to a specific user by name or position to ensure that

the metric is useful and relevant to that user. [Ref. 16:p. 68] It is better to tie a metric to a position, especially in the Government because of the high turnover rate. By tying a metric to a position, the organization can occasionally go back and verify that the data collected for that metric is still useful to the individual in that position or if the data need to be updated or even completely dropped due to changes in the organization or requirements.

Finally a metric should be examined to make sure that the data that are being collected and delivered to a specific user are timely. [Ref. 16:p. 68] Timeliness is an important attribute for any metric. Some metrics will become worthless to the user if the data are not provided in a timely manner. Metrics that are time related are used to provide warnings to the user that some aspect of their operation has fallen out of tolerance. For a metric to be useful it has to be delivered at the right time for the user.

#### **4. Objectives of Performance Metrics**

Once the performance metrics are decided upon for the goals, then the objectives for each metric must be chosen. Goals can be chosen at random with no logic or facts behind them, like deciding upon a twenty-five percent reduction in acquisition time. The problem with doing this is that an organization will not know if this goal is achievable or realistic in regards to other organizations performing the same functions. Also, the workforce will generally see that the objectives being set have no basis because random objectives are generally nice very round figures. On the other hand, one of the best methods of establishing realistic goals and to provide ideas for strategies to achieve your goals is benchmarking. [Ref. 12:p. 188]

Benchmarking is a continuous, systematic process for evaluating the products, services, functions, and work processes of organizations that are recognized as representing best practices. [Ref. 17:p. 4] Benchmarking allows an organization to compare itself to the functions, practices, and processes of top performers to identify the strengths and weaknesses of the organization. Benchmarking should take place after the performance metrics have been identified and a set of baseline metrics of the organization's processes have been completed. The purposes of benchmarking are [Ref. 17:p. 4]:

- Organizational improvement
- Organizational comparison
- Meeting or surpassing best practices
- Developing product/process objectives
- Establishing priorities, targets and goals

There are three types of benchmarking from which an organization can choose.

The first method is internal benchmarking which compares internal work processes and is used to identify internal performance standards. [Ref. 17:p. 5] This method will use the past performance of the organization from which they will determine what objectives should be set to achieve the goals.

The second method is competitive benchmarking which identifies and compares the products, services, and work processes of organizations that are direct competitors. [Ref. 17:p. 5] For DoD contracting organizations this could be an organization within the same Service or the comparison of contracting activities from different Services or other departments from the Executive Branch.

The final method is functional or generic benchmarking which identifies and compares the products, services, and work processes of organizations that may or may not be direct competitors. [Ref. 17:p. 5] The objective of this type of benchmarking is to identify the best in class. For this method DoD, should go outside of the Government and look to commercial enterprises since price-based acquisition is a practice that is used with greater frequency in the private sector. An organization that is setting their metric objectives through benchmarking should use multiple sources of data. From the benchmarking study an organization can then use the information that was gathered to set their appropriate metric objectives and possibly get some ideas on the strategies and approaches that can be applied to the organization. One of the main problems with this is that a strategy that worked well in one organization may not work well in another. [Ref. 12:p. 189]

## **5. Strategies**

Once the objectives for the performance metrics have been identified, the last step in the model is to determine how to achieve the goals and objectives. Figuring out the strategies that will help an organization achieve their goals is the difficult part of the process. Generally developing the strategies for the objectives is done through brainstorming to create a list of possible strategies that could impact the performance on the measurement. [Ref. 12:p. 187] After the list is created, then the organization must evaluate each strategy to determine if it is applicable and possible to implement. The following criteria can be used to evaluate each of the strategies [Ref. 12:p. 188]:

- Cost
- Projected impact on the measure and goal

- Politics or culture of the organization
- Time required to implement
- Risk – chance of failure
- Likelihood that management will approve of the strategy

Once a strategy or group of strategies have been chosen to achieve a specified objective, then a plan should be written and monitored to determine if the strategy is bringing about the desired results. It may take several attempts in developing a successful strategy that works for each of the objectives.

## G. SUMMARY

In order to use price-based acquisition a contracting organization must understand the various elements and goals that are to be accomplished with this acquisition reform initiative. Price-based acquisition is not just for procuring commercial items, but it can be used for various types of acquisitions. There is a different set of resources and knowledge that needs to be developed and implemented. The various cost categories that were required for cost-base acquisition are still important because these elements are used by companies to develop their pricing strategies. The understanding of the different pricing strategies that a firm may use in the market place is important to buyers so they can use price analysis to determine the value of goods and services that are being procured. It is through the use of price-based acquisition that DoD hopes to establish more commercial buying practices to achieve their goals of reducing costs, increasing access to commercial products and reducing Government infrastructure. In order to achieve these goals of price-based acquisition, DoD must establish an effective set of performance measurements for each of the goals. DoD will not be able to improve the effectiveness of price-based acquisition if they do not measure the results.

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### **III. DATA PRESENTATION**

#### **A. INTRODUCTION**

This chapter presents the responses from acquisition professionals at the policy and working levels of contracting organizations throughout the Department of Defense. These inputs lay out the current understanding of price-based acquisition throughout the Services and how each of them is currently employing this acquisition reform. In addition this chapter will look at areas where price-based acquisition has been used in the field. Finally this chapter will examine what people in the field believe should be measured and what metrics should be established to evaluate the use of price-based acquisition.

#### **B. POLICY LEVEL RESPONSES**

The questions listed in Appendix B were developed for acquisition professionals at the policy making level of DoD, the Service headquarters and the contracting directors at the major buying organizations throughout the Services. The following contracting organizations at the policy level agreed to provide responses to the questions: Air Force Material Command; Army Materiel Command; Naval Air Systems Command; Office of the General Counsel at the Naval Regional Contracting Command Detachment London; Tank-Automotive and Armaments Command; Office of the Under Secretary of Defense for Acquisition Reform; Office of the Assistant Secretary of the Army for Acquisition, Logistics and Technology; Office of the Secretary of the Navy; Inventory Control Point Mechanicsburg; U. S. Army Corp of Engineers; Special Operations Command; Air Logistics Center, Warner Robbins; Defense Supply Center, Philadelphia; Naval Sea

Systems Command; U. S. Army Communications Electronics Command; and Fleet Industrial Supply Centers, Norfolk and San Diego. Out of these organizations contacted there were twenty-one people who agreed to provide input to the policy level questions. These questions were used to gain an insight into how they define price-based acquisition, the goals that they see being accomplished through the use of PBA plus areas where they think price-based acquisition could be useful. The other part of these questions investigated what areas should be measured and what metrics would they want to see put in place so they could accomplish the goals of PBA. Any similar responses were combined so that only different responses are presented. The responses are separated according to their central themes. The responses to the six policy level questions are presented in the following sections.

## **1. Defining Price-Based Acquisition**

The first question that was asked of the policy level participants was, “How do you defined price-based acquisition?” The reason for this first question was to gauge how contracting organization’s upper management defines price-based acquisition. This question was designed to establish a basis for how the Services’ are defining price-based acquisition. The responses to this question will assist in determining how price-based acquisition in being applied by the Services. The responses to the first question have been divided based upon their focus.

### **a. *Price Focus***

The first group of responses focuses on using price as the key determinant of the various definitions that are given.

- PBA is a contractual relationship established on price.

- PBA has meaning in the context of both price analysis and contract pricing. From a price analysis perspective, PBA represents the degree to which the analysis relies on assessing the bottom line contract price rather than analyzing what it will cost the contractor. PBA refers to fixed price contracts rather than to cost reimbursement contracts.
- PBA is when the negotiated price is based on price analysis rather than cost analysis.
- Arriving at price without exclusively relying upon cost data. In addition it is important to evaluate the level of risk that is associated with the acquisition. A firm's past performance can allow DoD to deal with technical risk differently when the firm has a known process that can be trusted.

*b. Cost Focus*

This next set of responses to the first question focused on using cost to define price-based acquisition.

- An approach to determine fair and reasonable prices with a bias toward using methodologies other than cost data provided by contractors.
- Using other than cost and pricing data to establish a fair and reasonable contract value. This data consists of a variety of formats. However, we need to be able to build a relationship between the product or service we are procuring and the product that is the source of the data.
- PBA does not require access to contractor cost data or books and records to negotiate or administer the contract.

*c. Market Focus*

The final set of responses from the policy level participants settled on using market forces to help in defining price-based acquisition.

- PBA is great in a competitive commercial market place and is long overdue in the Government. It has pushed the acquisition community into the 21<sup>st</sup> century by streamlining practices. PBA does however raise the standard for the negotiation skills needed to navigate this area, especially where competition is lacking. In a cost based arena, the negotiator had some leverage and rationale in establishing a price. In PBA that is gone.

The negotiator has to develop a whole new set of questions, strategies and approaches to determine price reasonableness.

- Understanding the intrinsic value of the item is important to determine the value of the item, which is determined by the user.
- PBA is the acquisition of goods and services in which the contractual pricing relationship between the parties is based primarily on the market rather than on actual or estimated cost data plus profit.
- PBA is the opposite of cost-based acquisition where the buyer must determine the inherent value of the item and establish the price based upon market prices vice using certified cost or pricing data.

Thirteen out of the twenty-one responses favored a price focus in their definition. While three responses used a cost focus and five responses used a market focus in their definitions of price-based acquisition. Even though a majority of the responses centered on price in their definition there still was a wide and varied understanding of what price-based acquisition represents to the various contracting organizations throughout DoD at the policy level. The lack of any consistent definition at the policy level demonstrates why some contracting organizations have started to use price-based acquisition while other organizations have yet to make use of this acquisition tool. For the most part, price-based acquisition appears to be used mainly for competitive commercial procurements while the historical use of cost-based acquisition remains the safe and constant norm.

## **2. Goals for Price-Based Acquisition**

The second question was “What goals do you see being accomplished through the use of PBA?”. This question was developed to examine what the policy level makers wanted to see price-based acquisition accomplish. In order for this acquisition reform to be effective the goals need to be set forth so both the working level and industry understand them and can employ price-based acquisition to bring about those changes.

*a. Increasing Competition*

The first set of responses to this question centered on increasing competition and expanding the industrial base that DoD can draw from in order to maintain their technological edge.

- The main goal of PBA is to attract a wider contractor base, especially in bringing commercial contractors who cannot or will not provide cost proposals. It is also a goal to streamline the acquisition process.
- PBA allows for different product development.
- The goal is to give the Government greater access to technology by increasing the number of contractors that the Government deals with. Also a goal should be to reduce Government infrastructure and reduce contract prices.
- Encourage new vendors to deal with the Federal Government.
- Reduce the barriers of entry for contractors that do not have sophisticated accounting systems.

*b. Cost Savings*

This second group of responses focused on the prices that items are bought for and the cost savings that may be available by using price-based acquisition.

- Through the use of PBA, the Government should be able to purchase supplies and services at the best (equal or lower) prices that are available commercially from the most competent, responsive and responsible supplier.
- From the price analysis perspective, the PBA analysis is more efficient for both industry and Government. Industry doesn't have to provide cost data and the Government doesn't have to evaluate it. From the contract price perspective, contract risk is placed on the contractor in a fixed price contract and the costs associated with administering cost reimbursement contracts (audits, negotiation of indirect rates, etc) are reduced.
- PBA will eliminate the need for certification and the fear of criminal liabilities. Also, PBA may drive overheads down and increase competition.

- Most of the risk associated with cost estimation will be shifted to the supplier, since they are the ones making the estimates, and not the Government.
- PBA can satisfy industry by not requiring them to disclose cost information. Plus there is the potential to arrive at a fair market price vice taking cost and adding profit, which might be lower than what the market would pay.

*c. Cycle Time*

The next set of responses put the reduction of acquisition cycle time as their primary goal to be accomplished. The reduction of the cycle time may concentrate on the reduction of the administrative burdens, the actual production or the delivery times. This will be examined further in the next chapter.

- Reduce the acquisition cycle times and acquisition costs.
- It may streamline and expedite the preparation of sole source contractor proposals.
- The main goal should be to reduce the acquisition lead times and the costs of the goods and services.
- In the overseas environment, PBA may improve DoD's ability to procure spares and other goods/services, or conduct international operations or fight a coalition war, by reducing time spent now spent on verifying cost data for companies that don't traditionally follow our Cost Accounting Standards.

*d. Infrastructure*

There were several respondents that cited the reduction of Government infrastructure as one of the goals that should be accomplished through the use of price-based acquisition.

- PBA can reduce the Government's infrastructure and eliminate paper, which will also increase risk slightly.

The desired goals for price-based acquisition were divided among four basic areas. Ten out of the twenty-one responses focused on cost savings. This was the largest group out of the four areas. Increasing competition was mentioned five times and a reduction in cycle time was used four times. A reduction in infrastructure was cited twice in the responses. The primary themes that appeared in the responses are to reduce the acquisition time of the procurement and the associated costs, increase the number of contractors dealing with the Government which should increase the Government's access to technology and finally reduce Government infrastructure. These inputs will be examined further in the next chapters to determine what goals should be pursued.

### **3. Useful Areas and Applications for Price-Based Acquisition**

The next question posed to the policy level group was "What areas or applications do you see PBA being useful in?" This question looked at the possible uses of price-based acquisition to find out how wide and varied the potential field of procurements could be, as viewed by the policy makers within DoD and the Services.

#### **a. *Commercial Goods and Services***

The responses to this question are divided into two categories. The first category that is listed below is limited to using price-based acquisition for commercial items with adequate competition.

- PBA can be useful in procuring commercially available items for supplies and services along with some research and development services.
- PBA can be used in commercial item acquisitions and competitive acquisitions.
- From initial production on forward with competition.

**b. Other Opportunities**

The second set of responses is more varied than the first set of responses.

This set opens up the possibilities for the use of price-based acquisition a bit more. The central theme here is really to look beyond the current practices of using price-based acquisition for commercial items in competitive markets.

- Let all offerors understand the requirement and then take the risk of effective management to control costs and complete the work. The offeror has the majority of the risk, not the Government
- If you can build a relationship there could be no limit to what applications PBA could be used on.
- Conduct business with firms that are sophisticated in technology, but may not have sophisticated accounting practices.
- PBA can be used in most areas however the use in pure military applications is limited. However, it can be useful for military hardware such as F-16 aircraft, which have been bought using price analysis.
- Sole source forward pricing cases where our military purchase is a derivative (or modification) of an item with genuine commercial sales or similar to an item with a genuine commercial sales history.
- Pricing weapons systems. The Army routinely conducts “should cost studies” to ensure fair and reasonable pricing of major weapon systems. These studies consumed a tremendous amount of Government and supplier resources. Cost analysis is appropriate in a sole source environment, but does not necessarily need to be conducted on every buy. Commercial items should always use PBA. PBA may enhance competition.
- PBA could be useful in dissimilar competition, viable previous contracts, viable non-competitive contracts, out of production items, commercial like items, single process initiatives and items with a good production history like the Tomahawk.

Some of the responses in this section stayed with the safe practice of applying price-based acquisition to the procurement of commercial items in competitive markets. Commercial items were favored in the responses thirteen out of twenty-one times. However the responses for goods outside the commercial environment were

mentioned eight times. This second section presented some new ideas on how to increase and expand the use of price-based acquisition. There is evidence of this by the occasional listing of different acquisitions that have gone outside of the typical procurement cycle and used price-based acquisition for the procurement of goods in cases other than for commercial items in competitive markets.

#### **4. Measurements for Price-Based Acquisition**

The fourth question was “What areas of PBA should be measured?”. This question focused on finding out what the policy level group would like to see measured and monitored to determine the effectiveness of the price-based acquisition. While several of the answers to this question included several areas for measurement they all have been grouped into their strongest central themes.

##### **a. Costs**

In this first section the responses concentrated on areas that dealt with prices and costs associated with the acquisition process.

- There should be measures on prices obtained prior to using PBA, lead-time, administrative time, production time and the amount of competition.
- There should be a metric on the percentage of non-research and development dollars using PBA.
- There should be metrics that measure the number of acquisitions not requiring certified cost or pricing data to define the universe of potential PBAs.
- There should be measures for cost savings, acquisition time and quality.
- The areas that should be measured are the extent of use of PBA, the impact on prices and the savings achieved.

**b. *Competition and New Entrants***

This next section focused on the extent that competition and new companies were conducting business with DoD.

- There should be measures for level of competition, historic versus current price comparisons and cycle time.
- The success in bringing in new offerors from the commercial world, which should be measured along with price trends.
- Areas that should be measured are the use of dissimilar competition and if the Government changed our configuration to meet commercial products.

**c. *Cycle Time***

This group of responses is centered on reducing the cycle time of the acquisition.

- Measures should be established for historical lead times and prices.
- There should be metrics for performance and schedule.

**d. *General Comments on Measurement***

This last section does not present any specific areas for measurement, but just some general comments about creating metrics for performance measurement and creating lessons learned that could be reviewed by all contracting organizations to learn from previous acquisitions using price-based acquisition.

- Whatever items should be measured, these metrics should be in pairs so there is a counter measure to monitor negative effects of any metric.
- Data collected should be the number of actions processed along with lessons learned.

Each of these areas was given equal weight in the responses to this question. All three areas were each mentioned seven times. The answers revolved

around the measurement of acquisition cycle time, cost savings, and increasing competition.

## **5. Metrics for Price-Based Acquisition**

The fifth question that was asked of the policy level group was “What metrics would you suggest be used to measure PBA?” This question is a follow on to the fourth question by trying to create a useable set of metrics to measure and monitor the contracting actions that use price-based acquisition.

### **a. Costs**

The first group of responses centered around tracking and controlling costs in order to achieve savings through the use of price-based acquisition.

- A useful metric would be to measure the percentage of non-research and development dollars using PBA.
- Metrics in this area are tough to develop. It is hard to measure cost savings because cost savings are hard to quantify. Acquisition time is also hard to identify because there is no standard starting point. Quality is also hard to measure.
- Tracking process over time (cost versus price).
- Fund expenditures along with key performance events like testing and delivery.
- There should be metrics that measure how the price was determined, how long did the negotiation take if there was one and would the acquisition have used cost data before the shift to PBA.
- PBA metrics should include price reductions and procurement administrative lead-time reductions from previous acquisitions of the same item using CBA.

### **b. Number of Contracting Actions**

This set of answers focused on tracking the number of contracting actions that use price-based acquisition versus cost-based acquisition to conduct procurements.

- There should be metrics that measure the number of actions that used PBA, dollar amount of each action using PBA and the frequency of usage of fair and reasonableness based on prices of other offerors, market prices, competitive published prices and parametric analysis.
- There should be measures on the percent of acquisitions accomplished using PBA versus CBA. Savings associated with PBA versus CBA. Some analysis of the impact of PBA versus CBA on prices for services and equipment.
- There should be a measure on the number of actions processed along with lessons learned.
- A measure should be developed that looks at the tools the contracting officer used to arrive at a fair and reasonable price.
- There should be metrics that measure the type of acquisition, average lead times (administrative and production) segmented by commodity and industry, and competition by commodity and industry.

*c. Cycle Time*

The answers in this section concentrated on measuring the reduction in the cycle time of the procurement process.

- There should be a metric that measures historic lead times along with the number of acquisitions using this technique.
- There should be metrics for cycle time, price/cost growth, quality measures like mean time between failures, and use of non-traditional businesses doing business with the Government.
- There should be metrics for the satisfactory completion percentages per line item and the satisfactory completion percentage per contractor.

*d. Competition and New Entrants*

The final group of answers for this question looks at the number of new firms conducting business with DoD and the level of competition that was present during the use of price-based acquisition for a procurement.

- The number of new firms bidding on Government contracts.

- There should be a metric that tracks the number of competitive buys.

In addition to the possible metrics listed in this section a list of proposed metrics were presented in the Price-Based Acquisition Study Report from December 1999 which are listed for consideration for the analysis to be completed in Chapter V [Ref. 3:p. 134]:

- Establish a metric that measures the participation of primarily commercial suppliers as competitors for either prime or subcontractor roles in non-FAR Part 12 contracts.
- Establish a metric that measures the change in FAR Part 12, commercial prime contracts and contract dollars over time. The measure would be as a percentage of total number and dollar value of all contracts (or possibly contracts within a class).
- Establish a metric that measures the annual dollar value of commercial subcontracts when procuring non-commercial items. This measure would be as a percentage of total number and dollar value of all subcontracts (or class of subcontracts).
- Require each Service to identify FSC codes included in the DD350 database that are targets of opportunity for increasing commercial buying. After an initial benchmarking, the metric would be to track (by percentage) progress towards more commercial buying in these FSCs.
- Establish a metric that measures over time the decline in number of dollar value of cost-based acquisitions as a percentage of all acquisitions. For purposes of this metric a cost-based acquisition would be any one where the Government obtained certified cost or pricing data. This metric could have a stretch goal associated with it.
- Identify a set of acquisitions within each buying Agency that will be price-based pilots. Those pilot acquisitions should be ones that have historically would have been cost-based (e.g., sole source production contracts). The metric will be to compare the actual price for each of these pilot acquisitions to a pre-award independent estimate.

The question in this section is very similar to the fourth question by continuing to investigate actual metrics that could be applied to the acquisition process to specifically measure the use of price-based acquisition. The responses to this question were very similar to the answers received in question four. A metric for costs was

mentioned five times out of the twenty-one responses. Both cycle time and competition were each mentioned four times. There was one additional category added for metrics, which was the number of contracting actions. This area was mentioned eight times during the responses. The reason for this area having the most responses is because it can be easily measured. Overall it is apparent that price-based acquisition does not easily lend itself to development of a set of metrics in which to measure its effectiveness.

## **6. Thoughts on the Acquisition Continuum**

The final question that was asked of the policy level participants was “What are your thoughts on the acquisition continuum?”. The acquisition continuum was sent along with an advanced copy of the questions to each person participating in this survey. The acquisition continuum was used initially as a common starting point in answering the questions and also as a possible training tool for the acquisition workforce. The responses presented in this section are general comments on the continuum.

- The continuum shows a logical sequence when price-based acquisition can be used in comparison with the cost-based requirements.
- From the contract price perspective, the “Degree of Competition” continuum is inaccurate. There are many cost reimbursement contracts competitively awarded and may fixed price contracts awarded on a sole source basis.
- This is a tough technique for folks at the working level to grasp. They struggle where the relationship is other than a comparison to another commercial item.
- It doesn’t tell us anything useful and carries the connotation that one side is “good” and the opposite side is “bad” which is not true.
- I think it is a nice one-page summary of where PBA fits into the overall acquisition process.
- It is a common sense approach that shows the need to balance risk between cost and price data. A good visual tool. The use of PBA will require a cultural change.

- It depicts areas that should be realized in the acquisition strategy phase. This helps to determine the type of contracting we should or could proceed with.
- Overall very good, complexity doesn't have to stop the use of PBA.
- The keys to using the continuum are complexity of design, price competition and the risk element.
- The acquisition continuum would be a good training tool.
- The continuum is an accurate portrayal of the characteristics wherein PBA is appropriate and where it is not. It shows visually how we are stuck on the left hand side of the continuum for most of what a hardware systems command buys, either new technology research and development or non-competitive production of highly complex equipment for which there is no commercial marketplace influence on prices.

The responses listed in this section were the initial impressions from the acquisition professionals at the policy level on the usefulness of the acquisition continuum. Overall many of them, seventeen out of twenty-one, thought the acquisition continuum could be used as a good training tool. However there was some confusion by the remaining four in reviewing the continuum. They did not look at the continuum as something that flowed from each individual continuum, but that the continuum was a static picture that represented an all or nothing approach.

### **C. WORKING LEVEL RESPONSES**

The questions for the working level were developed along the same lines as the questions for the policy level and are displayed in Appendix C. The following contracting organizations at the working level agreed to provide responses to the questions: Communications Electronics Command; Naval Air Systems Command; Defense Contract Audit Agency; Defense Supply Center, Columbus; Air Logistics Center, Ogden; Naval Inventory Control Point, Philadelphia; Fleet Industrial Supply Center, San Diego; Air Force Materiel Command; Naval Supply Systems Command and

the Fleet Industrial Supply Center, Norfolk. Out of these organizations twelve people provided responses to the questions. These questions were aimed at the contracting specialists and first line supervisors to find out what they thought of price-based acquisition. There are several slight variations to these questions from the policy level questions that looked at finding out what actual procurements have used price-based acquisition and if their organizations had actually established specific metrics to evaluate price-based acquisition. Again similar responses are only presented once and the responses to each of the questions are divided up according to their central focus. The responses to the six questions designed for the working level are presented in the following sections.

## **1. Defining Price-Based Acquisition**

The first question presented to the participants at the working level was “How do you define price-based acquisition?” This was the same starting point for both groups. This question was asked to determine if the definition of price-based acquisition was similar at the two levels.

### **a. *Price Focus***

The first section of responses to this question defines price-based acquisition using price and price related factors.

- An acquisition for which we do not have price competition, but for which we do not require certified cost or pricing data because of either FAR Part 15 considerations, or the depth of information available impacting the acquisition, the material and the supplier.
- Making price reasonableness determinations based on the total price offered as compared to a competitive offer, past history, similar item comparison or other means other than looking at individual cost elements associated with the offer.

- A method used by the Government and industry to buy goods and services at a price that both the buyer and seller agree on based on the needs of the buyer and the abilities of the seller.
- Establishing a fair and reasonable price without getting into the details of individual cost elements.

***b. Cost Focus***

The second set of responses for this question focus around using costs and cost related factors in defining price-based acquisition.

- Using data other than bottom up cost data to establish a fair and reasonable contract value for an acquisition. However we still may need to obtain some level of cost data.
- In its purest form, we would establish contract prices without regard to the contractor's costs. This is most easily achievable where there is competition and least likely to be achieved in sole source procurements.
- PBA incorporates all of the acquisition reform processes and methods being implemented throughout the DoD which have the common characteristic of being an outcome driven acquisition, relying on forces other than certified cost data to establish and determine a fair and reasonable price.

***c. Market Focus***

The final group of answers to the first question uses the marketplace and performance in defining price-based acquisition.

- PBA is based on being knowledgeable in the marketplace and improving the performance boundaries with added value benefits throughout the life cycle of the product.
- Paying for the contract performance in order to insure performance and schedule compliance. It allows you to identify problems early on in the program.

The responses to question one from the working level participants were much more practical in applying price-based acquisition to everyday situations.

However, the focus of the responses from the working level mirrored the focus from the policy level. Seven out of the twelve responses used price as the key focus of their definition. Two of the responses relied upon cost, while the remaining three responses used the market to define price-based acquisition.

## **2. Price-Based Acquisition Procurements**

The second question that was asked of the working level participants was “What types of acquisitions have you used PBA on?” This question was used to examine how and to what extent price-based acquisition was being used in the field.

### **a. *Commercial Procurements***

The first group of responses focused on using price-based acquisition for commercial items with competition.

- All negotiators at FISC, San Diego use PBA in the development of their acquisitions in one form or another. We strive to utilize commercial practices as referenced in FAR Part 12. We use combined synopsis solicitations, Statement of Objectives, Statement of Needs, Advance Acquisition Planning, etc. We are achieving our goals of meeting the objectives of DoD’s access to the commercial sector of information technology and becoming a paperless business entity, while reducing the Government’s old infrastructure. We are obtaining better prices utilizing commercial methodologies.
- PBA has been used for commercial items and items with significant cost data supporting previous procurements and where significant competition exists.
- We have used PBA for the acquisition of supplies and for technical support services in competitive markets.

### **b. *Small Dollar Procurements***

The second group of questions used price-based acquisition in basically small dollar procurements.

- We only use PBA in small dollar procurements of commercial items.
- The majority of our buys are within the Simplified Acquisition Threshold (SAT) where the buyers determine the total price to be fair and reasonable based on comparisons.

*c. Large Dollar Procurements*

The last group of responses used price-based acquisition in larger dollar procurements were historical cost data was available.

- We have used PBA to procure replenishment spares and initial spares with the Original Equipment Manufacturers (OEMs) and prime manufacturers, for all dollar values including a \$98 million buy.
- We have used PBA in procurements for ARC-210 radios, Tomahawk Emergency Inventory Replenishment, F/A-18 F414-GE-400 engines, depot support for Tomahawk Missile Recertification and Navy Crew Common Ejection Seats.
- We have used it for recurring sole source production contracts.
- We have used PBA for Low Rate Initial Production (LRIP) and follow-on production contracts. Plus we have used PBA for Other Transaction 845 Agreements (cost sharing).

Again the responses to this question generally tended to use price-based acquisition primarily for the procurement of small dollar commercial items. Six out of the twelve responses focused on using PBA to procure commercial goods and services. Two of the responses only used PBA for small dollar procurements of commercial items. While four of the responses used price-based acquisition in procurements that were not commercial in nature.

**3. Measurements for Price-Based Acquisition**

The third question for the working level group was “What areas of PBA should be measured to judge the effectiveness of PBA?” This question was used to create a list of possible candidates of metrics for measuring price-based acquisition.

*a. Competition*

The first group of answers for this question looked at measuring the amount of competition available and the number of new companies bidding upon a procurement.

- Did we bring new suppliers to the market place? Did we reduce the cycle time to award the contract? Did we do the job better, cheaper and faster?
- Level of competition, historic/current price comparisons and cycle time.

*b. Cycle Time*

The second set of responses looked at measuring the reduction of the acquisition cycle time and getting the material to the user faster.

- There should be measures on acquisition processing time, cost savings, longevity of products and modifications and upgrades.
- There should be metrics for the reduction in procurement lead-time and comparison to subsequent actuals.
- Metrics should track performance and schedule.

*c. Cost Savings*

The last group of responses looked at taking into account the reduction in costs associated with using price-based acquisition.

- Compare what we have paid in the past for an item in a cost-based procurement to the price we pay under a price-based acquisition. Then attempt to quantify the administrative savings gained through the use of price-base acquisition. Attempt to identify the expansion in our supplier base achieved through price-based acquisition.
- Track how costs compare with historical prices and with inflation using an inflation index like Producer's Price Index (PPI).
- Contractor's actual profit at the completion of the contract and the reduction of cycle time.

The responses to this question tended along the same lines as the responses from the policy level participants. Cost savings was the largest area mentioned, with six out of the twelve responses. Cycle time was mentioned four times while competition was used only twice.

#### **4. Current Metrics for Price-Based Acquisition**

The fourth question posed to the working level participants was “Do you currently use any metrics to measure PBA?” This question was developed to find out if any contracting organizations were already using specific metrics to evaluate price-based acquisition.

- None currently, but we plan on tracking reduction in procurement lead-time and comparison to subsequent actuals.
- Not directly, however we do measure the number of FAR Part 12 contracts we let and the number of waivers of certified cost or pricing data granted.

At the time of this research no contracting activity was currently using any specific metrics to measure the performance of price-based acquisition. A couple of organizations are in the process of creating a group of metrics that will begin to monitor price-based acquisition.

#### **5. Metrics for Price-Based Acquisition**

The fifth question was the same for both the policy and working level groups. The question was “What metrics would you suggest be used to measure PBA?” Once again the same question was used to determine how close the thinking was between the policy and working levels in using price-based acquisition.

*a. Costs*

This first set of responses wanted to develop measures that examined the various aspects of costs associated with using price-based acquisition.

- I would want to know of every instance my agency did not use PBA under \$500 thousand, and every instance when the PCO required certified cost data when the requirements in FAR Part 15 for PBA use are met.
- For utilization of PBA, there should be measures for the number of waivers of certified cost or pricing data granted, the number of FAR Part 12 contracts issued, the number of refusals by contractors to provide certified cost or pricing data. This last item indicates where the Government has been forced to enter into a PBA contract against its will. In addition, I would look at the number of times certified cost or pricing data was requested by the Government when doing so was not required by regulation.
- Use Producer's Price Index (PPI) or other similar indices for a given commodity to determine if cost increases/decreases track the same as inflation.
- Create a metric to compare the actual price for each of these pilot acquisitions to a pre-award independent estimate.
- My suggestions would be price history, pricing method used, percentage of commercial item buys, cycle time, and level of competition.

*b. Cycle Time*

The final group of answers to this question presented measures that examined the reduction in the cycle time of completing the procurement process.

- Measure contract award cycle time reductions.
- Measure the reduction in procurement lead-time and comparison to subsequent actuals.
- There should be measures on key performance events like testing, fund expenditures and delivery.

The working level responses to this question focused around two areas, cost and cycle time. Cost was mentioned eight out of twelve times, while acquisition

cycle time was used four times. Several of the working level responses were the same as the policy level responses. Some of the same metrics mentioned by both groups for the measurement of price-based acquisition included the number of procurements using price-based acquisitions, reduction in lead times, and comparison of historical prices versus current prices using PBA.

## **6. Thoughts on the Acquisition Continuum**

The final question for the working level group was “What are your thoughts on the acquisition continuum? This question was used to determine if the acquisition continuum could be used as an effective training tool and if it represented any value to the working level. The responses presented here are general comments about the continuum.

- It is a good representation of the continuum between cost-based and price-based acquisition and is helpful in assisting one to grasp the overall concept.
- The continuum is a good tool to explain the PBA concept.
- It is useful as an overview, but much more detailed guidance is required at the working level.
- While factually accurate, I don’t find the continuum helpful to a contract specialist working real live acquisitions. It is at the 50,000-foot level and few buyers are tasked with the range of acquisition types it covers.

Overall the acquisition continuum was defined as basically factual and a good overview of the acquisition process. Ten out of the twelve responses thought the acquisition continuum could be used as a good training tool. The other two responses believed that the continuum was not useful and conveyed a connotation that cost-based acquisition was bad. The intent of the acquisition continuum was designed as a reference point from which to begin formulating possible acquisition strategies for an acquisition.

#### **D. POLICY VERSUS WORKING LEVEL**

Figure 3.1 shows a comparison of the main focus areas from the policy and working level responses. In order to apply and use an acquisition reform initiative like price-based acquisition their needs to be a common understanding of the process and the goals that are to be accomplished. The responses to the research presented in this chapter show a wide variation among the contracting organizations in how they interpret price-based acquisition, and how and what should be used to measure the effectiveness of price-based acquisition.

#### **E. SUMMARY**

This chapter presented the views of the acquisition professionals at the policy and working levels and their interpretation of price-based acquisition and how they believe this particular acquisition reform could be used. Chapters IV and V will provide an analysis of the price-based acquisition environment and a set of metrics that can be used to measure price-based acquisition in an effort to achieve the goals of this acquisition reform.

| Questions  | Policy Level   | Working Level  |
|--|--|--|
| How do you define PBA?   | Using price analysis to determine a fair and reasonable price for a fixed price contract.  | Making price reasonableness determinations based on total price to purchase goods. |
| What goals do you see being accomplished through the use of PBA? | Increasing Competition<br>Cost Savings<br>Reduce Cycle Time<br>Reduce Infrastructure   | Not in the working level questions.  |
| What applications do you see PBA being useful in?                | PBA is useful for procuring commercial goods in a competitive market.  | Not in the working level questions.  |
| What types of acquisitions have you used PBA on?                 | Not in the policy level questions.   | PBA is mainly used to procure small dollar commercial items.                       |
| What areas of PBA should be measured?                            | Costs<br>Competition<br>Acquisition Cycle Time   | Competition<br>Acquisition Cycle Time<br>Cost Savings                              |
| Do you currently use any metrics to measure PBA?                 | Not in the policy level questions.   | No activities are currently using any metrics for PBA.                             |
| What metrics would you suggest be used to measure PBA?           | Reducing Costs<br>Tracking the number of contracting actions that use PBA<br>Reducing Acquisition Cycle Time<br>Increasing Competition | Reducing Costs<br>Reducing Acquisition Cycle Time                                  |
| What are your thoughts on the Acquisition Continuum?             | A good summary of the acquisition continuum.   | A good tool to explain the PBA concept.  |

Figure 3.1. Comparison of Policy and Working Level Responses. [Produced by researcher]

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## **IV. ANALYSIS OF PRICE-BASED ACQUISITION**

### **A. INTRODUCTION**

This chapter will take the literature review introduced in Chapter II and the data presented in Chapter III and breakdown the data to create an overall picture of the price-based acquisition environment. This chapter will first create a working definition of price-based acquisition. The chapter will then analyze the goals and potential applications in which price-based acquisition may be useful. The chapter will then examine possible areas to be measured to monitor price-based acquisition, which will be used to create a core set of metrics to measure and evaluate the effectiveness of price-based acquisition that will be refined in Chapter V. The chapter will finish with an analysis of the acquisition continuum as a potential training tool for the acquisition workforce charged with the implementation of price-based acquisition.

### **B. PRICE-BASED ACQUISITION DEFINITION**

The first step that should be taken before initiating an acquisition reform such as price-based acquisition is to create a working definition that the acquisition workforce can use to gain an understanding of the reform. The Price-Based Acquisition Report defined price-based acquisition as a way for DoD to buy goods and services that does not rely primarily on a supplier providing cost data. [Ref. 3:p. 5] This definition provides a good basic overview of price-based acquisition, but it does not provide enough detail for the contracting community to take this procurement tool and apply it. Another definition found during the literature review for price-based acquisition was where market forces and business initiatives determine the price of a product or service, and management is

based on performance parameters. [Ref. 4:p. 3] Again this definition does not provide the users with enough detail on what price-based acquisition is and how it can be used. Neither of these definitions takes into account risk or the type of analysis required to ensure that the price of the procurement is fair and reasonable. The lack of a good working definition and understanding of price-based definition is demonstrated by the variation in the responses among the Services and the differences in the definitions provided by the policy and working level participants. A working definition is the act or process of stating a precise meaning or significant formulation or a meaning. [Ref. 12] In order to form a working definition of price-based acquisition, the policy and working level responses from Chapter III were analyzed. There are certain elements from the policy and working level definitions that will be useful in creating a working definition for price-based acquisition. Before actually creating a definition for price-based acquisition, the definitions from Chapter III were broken down to pull out the key elements.

### **1. Price and Cost Analysis**

The first part of the analysis will start with a broad approach towards defining price-based acquisition. PBA results in a contractual relationship between the buyer and the seller that is based on price, not on certified cost or pricing data. The distinction here is that while certified cost or pricing data are not used, other than cost or pricing data can be used in the determination of the contract price. There is a requirement that the price of the contract is determined to be fair and reasonable. A fair and reasonable price can be determined by using either price or cost analysis or both. While in price-based acquisition there may be some use of cost analysis, it will not be to the same degree as in

cost-based acquisition. The cost analysis used for price-based acquisition will only include an analysis of the key cost drivers of the procurement and not an analysis of each individual cost element. However, the use of price analysis for price-based acquisition is the key method for determining that the price of a contract is fair and reasonable. In order to conduct an adequate price analysis of a good or service, the contracting officer must have an understanding of the various pricing strategies that a firm may employ.

There are several methods that can be used to conduct price analysis [Ref. 10:p. 280]:

- Comparison of proposed prices received in response to the solicitation
- Comparison of previously proposed prices and contract prices with current proposed prices for the same or similar end items, if both the validity of the comparison and the reasonableness of the previous price(s) can be established
- Use of parametric estimating methods/application of rough yardsticks (such as dollars per pound or per horsepower, or other units) to highlight significant inconsistencies that warrant additional pricing inquiry
- Comparison with competitive published price lists, published market prices of commodities, similar indexes, and discount or rebate arrangements
- Comparison of proposed prices with independent Government cost estimates
- Comparison of proposed prices with prices obtained through market research for the same or similar items

A contracting officer can establish a fair and reasonable price based upon price analysis coupled with a solid understanding of commercial pricing strategies.

## 2. Risk

The second part of the analysis for the working definition of price-based acquisition deals with the risk associated with the procurement. With any acquisition, risk must be taken into account. At the beginning of the acquisition process the level of risk must be determined so that the right acquisition tools can be used to obtain the goods

and services at the best possible price in the least amount of time. If the amount of risk can be mitigated in which a contracting officer can determine a fair and reasonable price without relying upon certified cost data, then price-based acquisition should be used. So by taking all of the different aspects from the various definitions of price-based acquisition the following working definition has been developed.

This working definition is based upon the two primary factors of using price and cost analysis to determine a fair and reasonable price and the mitigation of risk associated with an acquisition.

Price-based acquisition is a contracting strategy that mitigates risk through price and/or cost analysis that does not use certified cost or pricing data to determine a fair and reasonable price in the procurement of goods and services for the Department of Defense.

### **C. PRICE-BASED ACQUISITION GOALS**

With any acquisition reform, there are goals that need to be established which guide the way for the expected achievements of the acquisition reform. Price-based acquisition is no different in this respect. This section analyzes the proposed goals from the literature review and the policy level responses from the contracting organizations throughout the Services. The working level participants were not asked this question. There are three stated objectives from the literature review that are to be achieved through the use of price-based acquisition [Ref. 3:p. 3]:

- To reduce the prices of military products through civil/military business integration and increased efficiency
- To increase access to commercial products, technology and services
- To reduce Government infrastructure

In addition to the three goals listed in the Price-Based Acquisition Report, the main goals that were gathered from the policy level responses were increasing competition, reducing costs, acquisition cycle time and infrastructure. The list of proposed goals can be subdivided into five basic goals. The goals are to: 1) increase competition, 2) reduce the cost of the acquisitions, 3) reduce the cycle time of acquisitions, 4) increase DoD's access to technology and commercial products, and 5) reduce the Government's infrastructure.

### **1. Increase Competition**

The goal of increasing competition and bringing in new companies to bid for Government contracts is tightly connected with one of the main premises of price-based acquisition. As noted in several of the policy level responses, many of the contracting organizations only use price-based acquisition in competitive markets for commercial items. By utilizing price-based acquisition in more procurements this should increase the number of firms bidding on the solicitations since they will not have to submit certified cost or pricing data. Not having to submit certified cost or pricing data should help in reducing the barriers to entry for those firms that may be technologically sound, but do not have a sophisticated accounting system required by the Government for cost-based acquisitions. By employing this contracting strategy, price-based acquisition may help achieve this goal through increased use and education of the industrial base.

### **2. Reduce Acquisition Costs**

With fewer funds to spend on the procurement of goods and services for DoD, the goal of reducing costs is always behind any acquisition reform. This goal can be tied into the first goal of increasing competition and bringing in new companies to bid for solicitations put out by DoD. Generally increased competition will drive down the costs

of a good or service. Another factor that may assist in reducing the costs is that price-based acquisition will require fewer support services in auditing cost data from the companies in their proposals. However this cost should not be counted on too soon because these services will still be required for other acquisitions. Finally the last cost savings may come from a reduction in the time it takes to procure and deliver the goods and services to the users. If materials can be procured and delivered to the user at a faster and more efficient rate than less material may have to be kept on hand in warehouses to satisfy requirements.

### **3. Cycle Time Reduction**

The third goal is to reduce the acquisition cycle time of a procurement. This cycle time can be divided into two sections. First is the administrative segment, which is from the time the requirement is received until the time when a contract is in place. The second segment of this cycle is the production lead-time, which is the time from which the contract is in place until the satisfactory delivery of the goods or services to the customer. While the actual production segment of the cycle time will probably not change very much, the administrative segment of the cycle time can be reduced through the use of price-based acquisition. Depending upon the complexity, risk and amount of competition associated with the procurement, the use of price-based acquisition should take less time than the use of cost-based acquisition even with the requirement for price analysis. The ability of the contracting organization to complete acquisitions using price-based acquisition may allow acquisition professionals to have more time to complete other procurements.

#### **4. Increase Access to Technology**

The goal of providing DoD greater access to firms that produce commercial state of the art technology is important to the success of DoD maintaining its technological edge over its adversaries. This goal can be tied into the other goal of increasing competition and reducing the barriers to entry. Many of the high tech companies do not conduct business with the Government because of the requirement to open up their cost data to Government review. With the use of price-based acquisition, this requirement is no longer needed and may entice some of these firms into entering into contracts with DoD because the acquisitions will be conducted on price analysis and market forces.

#### **5. Reduce the Government's Infrastructure**

The final proposed goal of reducing the Government's infrastructure through the use of price-based acquisition is not one that should be readily pursued at this time. With the previous reductions in the acquisition workforce over the past several years, further reductions could hinder the implementation of new acquisition reforms such as price-based acquisition. As price-based acquisition gains more attention and use, it will become more important to restructure the acquisition workforce and refocus the abilities of the workforce to fit the changing needs of the acquisition processes. One of these changes may be to move people from auditing positions to new positions that conduct market surveillance and research. Based on these conclusions, this goal is dropped from the list of goals for this study.

The goals that should be pursued through the use of price-based acquisition are to:

- 1) reduce acquisition costs, 2) increase competition, 3) reduce the acquisition cycle time and 4) increase DoD's access to state of the art technology. These four goals in many

areas are interrelated with each other. The achievement of one goal, such as increasing competition, should aid in achieving other goals such as reducing acquisition costs.

#### **D. POTENTIAL APPLICATIONS FOR PRICE-BASED ACQUISITION**

The potential applications and areas of use for price-based acquisition are wide and varied. There are many possible procurements to which price-based acquisition could be applied beyond commercial goods and services in the competitive marketplace. While the majority of the responses from both the policy and working levels connected the procurement of commercial goods and services in a competitive market to the use of price-based acquisition, there are many other opportunities. The following list provides several applications for price-based acquisition:

- Replenishment spares with production history.
- Initial spares with costs that can be reasonably estimated.
- Any contract that has multiple sources of supply including initial production.
- Recurring sole source production contracts.
- Subcontracts for major weapon systems.
- Research and development contracts.
- Contracts for Low Rate Initial Production (LRIP).
- Follow on production contracts with a good production history.
- Situations with dissimilar competition and out of production items.
- Sole source contracts where the military item is a derivative (or modification) of an item with genuine commercial sales or similar to an item with a genuine commercial sales history.

While this is not an all-inclusive list of uses for price-based acquisition, it does show that some contracting organizations are using price-based acquisition for procurements in areas other than in competitive commercial markets. In developing the acquisition strategy one of the keys in using price-based acquisition is to look at the entire

procurement. It is important to always start with the associated risk of the acquisition, but there may be opportunities to mitigate the risk through the use of areas like competition and the ability to determine price reasonableness. There are many levels to the acquisition continuum and each level should be reviewed to determine if price-based acquisition is right for the procurement. Price-based acquisition is not right for all procurements, but it can be used in numerous procurements outside of the competitive commercial marketplace.

#### **E. METRICS AND AREAS OF MEASUREMENT FOR PRICE-BASED ACQUISITION**

In order to achieve the four goals of price-based acquisition, contracting organizations must be able to measure their progress against the stated goals. In order to maximize the use of price-based acquisition, a set of metrics must be established to monitor and evaluate DoD's success in achieving these goals. A group of proposed metrics was developed from the policy and working level responses and the literature research. The development of this group of metrics was based around the achievement of the four goals of price-based acquisition. The following proposed metrics are listed below:

- Track the administrative lead times of procurements using price-based acquisition.
- Track the number of firms doing business with DoD for the first time.
- Track the number of firms who would not have bid on a contract if certified cost or pricing data were required.
- Track every instance when a PCO required certified cost data when the requirements in FAR Part 15 were met.
- Track the number of acquisitions using price-based acquisition and cost-based acquisition.

- Track the on-time deliveries for procurements using price-based acquisition.
- Track how costs compare when procurements use price-based acquisition with historical prices that used cost-based acquisition against inflation.
- Compare the actual price for a group of pilot acquisitions to their pre-award independent estimates.
- Measure the decline in the dollar value of cost-based acquisitions as a percentage of all acquisitions.
- Measure the obligation cost of the contracting office to spend one dollar of their customer's funds for procurements that use price-based acquisition.
- Track the number of protests sustained by GAO and the Court of Federal Claims that used price-based acquisition.
- Compare the percent achievement of socio-economic goals by price-based acquisition and cost-based acquisition.
- Track the time it takes to award a negotiated procurement using price-based acquisition.

In the following section each of the performance metrics will be evaluated to determine if they are a baseline, trending, control or diagnostic measure. Then each metric will be linked to at least one of the four goals. This will measure the effectiveness of that particular goal. Once each of the metrics are linked to a goal it will be determined if that metric should become one of the core metrics for price-based acquisition or if the metric should be discarded.

### **1. Increase Competition**

The first goal of price-based acquisition is to increase competition. This particular goal is not an easy goal to measure because there are numerous factors that could be responsible for an increase in competition such as new firms starting up. The following performance measurements were selected as candidates to determine if price-based acquisition is increasing competition in DoD's procurements:

- Track every instance when a PCO required certified cost data when the requirements in FAR Part 15 were met.
- Track the number of firms doing business with DoD for the first time.
- Track the number of firms who would not have bid on a contract if certified cost or pricing data was required.
- Measure the decline in the dollar value of cost-based acquisitions as a percentage of all acquisitions.
- Compare the percent achievement of socio-economic goals by price-based acquisition and cost-based acquisition.
- Track the number of acquisitions using price-based acquisition and cost-based acquisition.

The first metric that will be analyzed for this goal is to “Track every instance when a PCO required certified cost or pricing data when the requirements in FAR Part 15 were met”. This metric would be used to determine if contracting officers were relying on certified cost or pricing data when they could use price analysis instead to determine the price. The requirements when certified cost or pricing data should not be obtained are [Ref. 18:p. 15.403-1]:

- When the contracting officer determines that prices agreed upon are based on adequate price competition
- When the contracting officer determines that prices agreed upon are based on prices set by law or regulation
- When a commercial item is being acquired
- When a waiver has been granted
- When modifying a contract or subcontract for commercial items

This metric measures the creation of an artificial barrier to entry created by the contracting organization against firms that do not have the accounting system set up to provide certified cost or pricing data. This metric would have trending and diagnostic measures associated with it. The trending measure would be to track the number of occurrences subdivided by predetermined contract values over time that certified cost or

pricing data were required when the requirements in FAR Part 15 were met. The diagnostic measure for this metric would be any increase in the trend for this metric which would alert the contracting organization that the procurement officials were increasing their use of certified cost or pricing data.

The next metric for the measurement of this goal is to “Track the number of firms doing business with DoD for the first time”. This metric may be the truest measurement of this goal from the proposed list. This metric would have baseline and trend measures. The baseline measure for this metric would be to compile the current number of firms by industry with which contracting organization is currently conducting business. The trend measure for this metric would be to track the number of new firms doing business with the contracting organization. By subdividing this metric by industry it would allow a contracting organization to know their current level of competition and to see if they were bringing in new firms from the industry areas that they required.

The following metric for this goal is to “Track the number of firms who would not have bid on a contract if certified cost or data were required”. This metric will allow a contracting organization to determine if the requirement of certified cost or pricing data is a reason why firms will not bid on proposals that require certified cost or pricing data. This metric would have a trend measure. The metric would trend the number of firms bidding on a proposal that used price-based acquisition against offeror’s responses that they would not have bid on the proposal if certified cost or pricing data were required.

Another metric for this goal is to “Measure the decline in the dollar value of cost-based acquisitions as a percentage of all acquisitions”. The measurement of this goal could cause the acquisition workforce to modify their procurement practices to achieve

this goal. While the idea behind price-based acquisition is to move more to commercial business practices, the contracting officers must still build their acquisition strategies based on the best interests of the Government. This metric could cause some of the workforce to change their behavior to meet the goals of this metric by using price-based acquisition when cost-based acquisition may have been the best method for the associated risk of the procurement. For this reason, this metric is removed from consideration.

The next metric for this goal is to “Compare the percent of socio-economic goals by priced-based acquisition and cost-based acquisition”. While the achievement of the socio-economic goals are a desirable result, the measurement of this particular metric could actually curtail competition by eliminating some new firms that are interested in conducting business with DoD that do not meet the small business criteria. This particular metric should be monitored, but it should not be broken down by the use of price-based acquisition at this time. Due to these reasons this metric is removed from the core set of metrics.

The final proposed metric is to “Track the number of acquisitions using price-based acquisition and cost-based acquisition”. This metric does not directly measure the goal of increasing competition. By tracking this metric a contracting organization could get an approximation of how often they were using the two methods, but it does not allow a contracting organization to effectively change their methods to increase competition. By tracking this metric, especially if there is a goal attached to it, this metric could result in unwanted behavior by the workforce. In order to meet the goal for this metric the workforce could use price-based acquisition when cost-based acquisition was a better acquisition strategy. For these reasons, this metric is dropped from consideration.

The performance measurements that have been selected for the goal of increasing competition are: 1) Track every instance when a PCO required certified cost or pricing data when the requirements in FAR Part 15 were met. 2) Track the number of firms doing business with DoD for the first time. 3) Track the number of firms who would not have bid on a contract if certified cost or pricing data were required.

## **2. Reduce Acquisition Costs**

On the surface, the goal of reducing acquisition costs appears to be fairly easy to collect data and measure the outcome of the metrics. However, the one area that must be taken into consideration is that a simple comparison of two acquisitions with one using PBA and the other using CBA must take into account the economic conditions of each of the acquisitions since they probably will not be done simultaneously. The following proposed performance measurements were selected for this goal:

- Track how costs compare when procurements use price-based acquisition with historical prices that used cost-based acquisition against inflation.
- Compare the actual price for a group of pilot acquisitions to their pre-award independent estimates.
- Measure the obligation cost of the contracting office to spend one dollar of their customer's funds for procurements that use price-based acquisition.

The first metric for this goal is to "Track how costs compare when procurements use price-based acquisition with historical prices that used cost-based acquisition against inflation". This first metric should provide a good measure of this goal in that it tracks the prices of procurements subdivided into commodities and then allows a comparison of these prices to procurements that have used cost-based acquisition in the past. The use of an inflation index like the Producer's Price Index (PPI) will allow a contracting organization to take out some of the economic effects so that a true comparison can

be accomplished. This metric will have a baseline measure and a trending measure. The baseline measure will be the historic prices of procurements that have traditionally used CBA divided by commodities. The trending measure will track prices by commodities of procurements that use price-based acquisition. The inflation index will be applied to the prices so that a better comparison of the two methods can be accomplished.

The next measure for this goal is to “Compare the actual price for a group of pilot acquisitions to their pre-award independent estimates”. While this will prove to be a relatively short term metric in comparison to the other core performance metrics, this metric should still be undertaken. Since the use of price-based acquisition has not been fully implemented by the Services, this metric could be a catalyst for the use and understanding of price-based acquisition within DoD. This metric will have control and diagnostic measures. The control measure for this metric will be the independent estimates for each of the pilot acquisitions. If one of the prices of a pilot acquisition exceeds the independent estimate then that contracting organization will be able to review the process to determine why that acquisition exceeded the estimate.

The last proposed metric for this goal is to “Measure the obligation cost of the contracting office to spend one dollar of their customer’s funds for the procurements that use price-based acquisition”. This metric will be a good measure of the goal to reduce acquisition costs. This metric will have baseline and trending measures. The baseline measure for this metric will be to track the current obligation costs for procurements that use cost-based acquisition. In order to trend the obligation costs for procurements that use price-based acquisition, the contracting organization will have to track separately the labor and non-labor costs of both acquisition methods. The obligation costs can be

combined to provide the contracting organization with their overall obligation cost. The combination of these two measures can be included as a control measure with a limit set on obligation costs that can be diagnosed by going back to the individual obligation costs if the trend begins to rise.

The performance measurements that have been selected for the goal of reducing acquisition costs are: 1) Track how costs compare when procurements use price-based acquisition with historical prices that have used cost-based acquisition against inflation. 2) Compare the actual price for a group of pilot acquisitions to their pre-award independent estimates. 3) Measure the obligation cost of the contracting office to spend one dollar of their customer's funds for procurements that use price-based acquisition.

### **3. Cycle Time Reduction**

There are several measurement areas that are proposed for the goal of reducing the cycle time of an acquisition. The data collection for these metrics should be easier to accumulate than the data needed for some of the other core metrics. The metrics for this goal are listed below:

- Track the administrative lead times of procurements using price-based acquisition.
- Track the on-time deliveries for procurements using price-based acquisition.
- Track the number of protests sustained by GAO and the Court of Federal Claims that used price-based acquisition.
- Track the time it takes to award a negotiated procurement using price-based acquisition.

The first proposed metric that will be analyzed for this goal is to "Track the administrative lead-time of procurements using price-based acquisition". Administrative lead-time is defined as the time from receipt of a valid requirement until that requirement

is placed on contract. This metric will provide a good measure for monitoring the goal of reducing the acquisition cycle time. The collection of the data for this metric should be readily available at each of the contracting organizations. This metric will have a baseline measure and a trend measure. The baseline measure for this metric will be to determine the administrative lead-time for procurements that have used cost-based acquisition. The baseline measure should be subdivided into similar commodity segments so a comparison of the administrative lead times of procurements using price-based acquisition can be accomplished. By creating a baseline measure for different commodities, a comparison can readily be made of the administrative lead times for PBA and CBA. The trend measure for this metric will be to track the administrative lead-time for procurements of price-based acquisition. These two measures can be combined to allow a contracting organization to review their overall administrative lead-time.

The next metric for this goal is to “Track the on-time deliveries for procurements using price-based acquisition”. This metric will need to be compared to the on-time deliveries for procurements using cost-based acquisition. While the data for this metric should be readily available at a contracting organization and would provide an organization with valuable information, this metric is not a good core performance measure for this goal. The reason for this is that there are too many variables that can cause a contractor to miss a scheduled delivery time such as production equipment problems that cannot be directly influenced by the acquisition strategy of price-based acquisition. This metric could be used as a secondary measure to track the performance of price-based acquisition, but for this study this metric will be dropped.

The third proposed metric for this goal is to “Track the number of protests sustained by GAO and the Court of Federal Claims that used price-based acquisition”. This measure could possibly establish an interesting correlation between sustained protests of procurements that used PBA and CBA, but this particular metric does not establish a strong link between the strategies of price-based acquisition in reducing the acquisition cycle time. There are many causes, such as the failure to follow the source selection plan, that could be the reason for a protest to be sustained. Since there is not a strong correlation between this metric and reducing the acquisition cycle time through the use of price-based acquisition, this metric will be dropped from the set of core performance measurements.

The final metric for this goal is to “Track the time it takes to award a negotiated procurement using price-based acquisition”. This measurement area has a direct impact on the time that it takes to award a contract. By using price-based acquisition as the procurement strategy, the negotiation time should be reduced since each individual cost element will not have to be reviewed. This metric will have a baseline measure and a trend measure. The baseline measure for this metric is to track the negotiation times of procurements that have historically used a cost-based acquisition. This baseline measure should be divided into commodities so that the comparison can be for similar procurements. The trend measure for this metric will be to track the negotiation time of different commodities that have used price-based acquisition. These two measures can be combined to get an overview of the average time it takes the organization to conduct a negotiation.

The performance measurements that have been selected for the goal of reducing the acquisition cycle time are: 1) Track and compare the administrative lead times of procurements using price-based acquisition to procurements that are using cost-based acquisition. 2) Track and compare the time it takes to negotiate contracts that use price-based acquisition against procurements that use cost-based acquisition.

#### **4. Increase Access to Technology**

The final goal of increasing access to state of the art technology is not a goal that can easily be measured. While this is an important goal for DoD, there were no suggested measures from the responses to track this goal. The performance metric that has been selected for analysis is to “Track the number of firms doing business with DoD for the first time”. This metric is the same one that was chosen to measure the goal of increasing competition. While this is the only suggested metric for this goal, it can be tailored to achieve the objective of tracking new firms. This measure must be subdivided into the different technology industries such as electronics and computer software with which DoD intends to increase their ability to conduct business. This metric will have baseline and trend measures. The baseline measure for this metric will be to determine the number of firms in each segment and how many of these firms are currently bidding on contracts with the contracting organization. The trend portion of this metric will be to track the number of new firms conducting business with the buying organization and the current number of businesses conducting business with the organization. The trend measure will also act as a diagnostic measure. If there is a downward trend in the number of overall technology firms that are conducting business with the organization, then the

organization can go to each of the individual segments to determine which one is declining and then begin the analysis to determine why this is happening.

The metrics listed in this chapter are the core set of performance metrics that will be used to measure the performance of price-based acquisition in achieving the goals that have been developed for price-based acquisition. With the use of price-based acquisition in its early stages, the core set of metrics that were selected are ones that should have a direct effect on the achievement of the goals for price-based acquisition and the metrics should have data that are readily available. The baseline measures for these metrics have tended to be based on procurements that have used cost-based acquisition. The reason for this is to monitor and evaluate whether or not the use of price-based acquisition is really providing the Government with a marked improvement in the acquisition of goods and services over current acquisition practices.

#### **F. THE ACQUISITION CONTINUUM AS A TRAINING TOOL**

The acquisition continuum presented in Appendix D was developed as a tool to graphically show how price-based acquisition and cost-based acquisition interact along the acquisition continuum. At the left end is pure cost-based acquisition and at the right end is pure price-based acquisition. Between these two end points is the acquisition continuum, which consists of a mix of these two acquisition processes. The responses from the survey give a representative view from the policy and working levels of their thoughts on the acquisition continuum. Both groups strongly believed that the acquisition continuum could be used as a training tool that procurement professionals could use as a starting point in deciding whether or not an acquisition should use a price-based acquisition strategy or a cost-based acquisition strategy.

The acquisition continuum is comprised of several levels that should be reviewed when creating an acquisition strategy for a procurement. While in some procurements the contracting organization may find themselves closer to the left side of the acquisition continuum this should not rule out the use of price-based acquisition. The overall level of risk must be evaluated and analyzed to determine if there are opportunities to mitigate the risk levels which would enable a contracting officer to determine a fair and reasonable price without requiring certified cost or pricing data. The acquisition continuum is an overview of the acquisition process and can be used as a tool to gain an understanding of the overall concept and framework. The acquisition continuum does not represent a good side or a bad side, but an overview of where to start the acquisition process. Once a framework is established, more detailed information will need to be gathered to complete the acquisition strategy. Overall, the acquisition continuum received positive responses from the acquisition professionals interviewed.

## **G. SUMMARY**

This chapter analyzed the available literature on price-based acquisition and the survey data collected from the acquisition community. First, a working definition of price-based acquisition was developed for the acquisition workforce. This chapter then examined the goals and possible areas in which price-based acquisition could effectively be used in procurements. Finally a list of proposed performance metrics was developed from the literature review and the survey responses, which was then subdivided by the four goals of price-based acquisition. The proposed performance metrics for each goal were analyzed to create a core set of performance metrics that should be used to measure

the effectiveness of price-based acquisition. The strengths and weaknesses of the core set of metrics for price-based acquisition will be analyzed in Chapter V.

Price-based acquisition can be a powerful tool in the procurement process that will enable a contracting organization to buy goods and services faster and cheaper. However, price-based acquisition is not a cure all to solve all of DoD's acquisition problems. The level of risk associated with an acquisition must be carefully addressed. Price-based acquisition can be applied to many new procurements if buying organizations take the chance and opportunity to step outside of traditional procurement methods.

## **V. ANALYSIS OF METRICS FOR PRICE-BASED ACQUISITION**

### **A. INTRODUCTION**

With the strategic vision and goals selected for this acquisition reform, the performance metrics that will be used to monitor and measure the accomplishment of these goals must be defined and evaluated. This chapter will analyze the implementation of the core set of performance metrics for price-based acquisition tied up to the goals they are to support. Each measurement associated with the performance metric will be examined to determine what data will be measured. From this analysis the core set of performance metrics for price-based acquisition will be ready for implementation.

### **B. METRICS FOR INCREASING COMPETITION**

The first goal for price-based acquisition is to increase the amount of competition for solicitations. The intent of these performance metrics is to track and evaluate if the use of price-based acquisition is encouraging new firms to conduct business with DoD. There are three core performance metrics attached to this goal and associated performance measures depending upon how the metric is defined and set up. Figure 6.1 displays the goal and the associated metrics and measures.

#### **1. Use of Certified Cost or Pricing Data**

The first metric is designed to track every instance when a PCO requires certified cost or pricing data when the requirements in FAR Part 15 are met. The reason for this metric is to reduce or eliminate a potential barrier to entry for firms that are capable of performing services for DoD, but do not have the accounting system for tracking and breaking down cost elements required for cost reimbursable contracts.

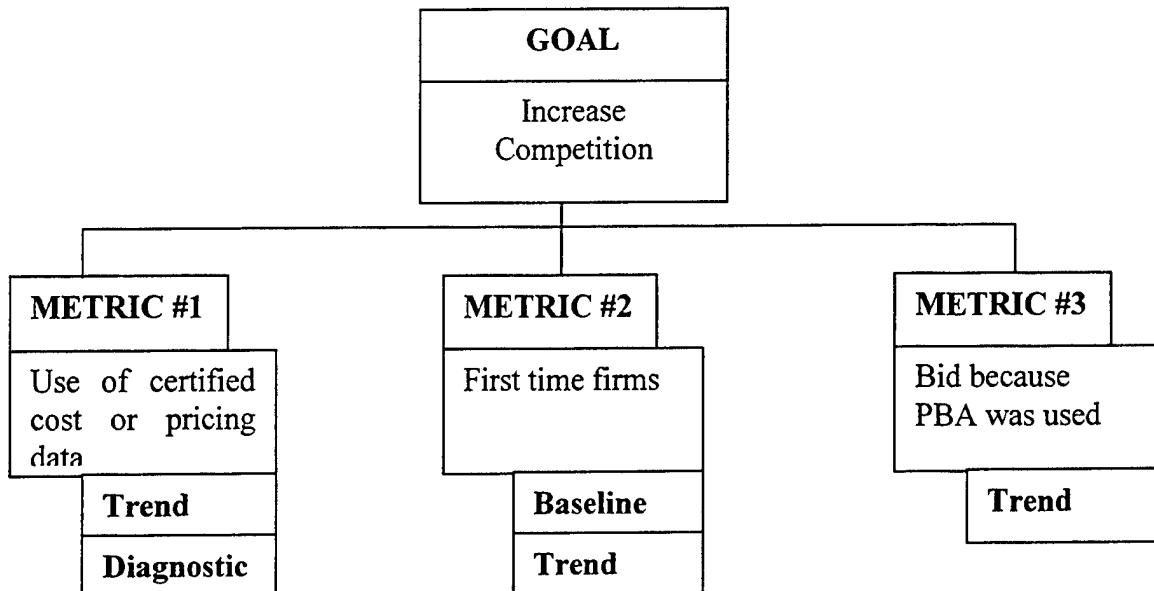


Figure 6.1. Goal of Increasing Competition. [Produced by Researcher]

The creation of the performance measures for a metric will drive how the metric will be used to track and evaluate the associated goal. The evaluation of the results may force a change in the way business is being conducted or in the metric or measures themselves. The first performance measure for the first metric is a trend measure. The data collected for this measure will be the number of times that a contracting officer requires certified cost or pricing data for a contract action when the requirements in FAR Part 15 are met. This measure should be tracked by various dollar value increments of the contracts. This will allow a contracting organization to see if contracting officer's favor certified cost or pricing data at a particular dollar value.

The second performance measure for the first metric is diagnostic. This measure will not be initially available until some data have been collected and a trend develops. The diagnostic measure will be used to investigate any upward trend for this metric in

any of the dollar value increments, especially at the smaller dollar value levels where price-based acquisition should be used the majority of the time.

## **2. First Time Firms**

The second metric for this goal is to track the number of first time firms conducting business with DoD. This metric is trying to assess if price-based acquisition is responsible for bringing in new firms. There could be several reasons for new firms entering into business with DoD such as new start-ups that are not directly linked to the use of price-based acquisition. However, this metric will still give a contracting organization an idea of the current number of firms they do business with in a particular industry and if the number of firms for that industry is increasing, decreasing or remaining steady.

The first measure for this metric is the baseline. The baseline for this measure will be the current number of firms categorized by industry with which the contracting organization is currently doing business. The major problem with this measure is in establishing an accurate number of viable firms for each industry and then maintaining an accurate count for each industry.

The trend measure for this metric is to track the number of first time firms conducting business with the contracting organization by industry. The data for this measure will be collected from responses required in the solicitations. The question for this measure would be “Is this the first time that you are contracting with this organization or Department of Defense?” By collecting these data by industry it will allow a contracting organization to concentrate on key technologies that are important to their contracting efforts.

### **3. Bid Because Price-Based Acquisition was Used**

The final metric for this goal is to determine if use of the price-based acquisition strategy is responsible for firms bidding on DoD solicitations. The reason behind this metric is to try and determine if firms are more willing to bid on solicitations if they are not required to submit certified cost or pricing data. While the answer to this metric may appear obvious, the collection of these data will help demonstrate the usefulness of price-based acquisition as another contracting strategy to members of the acquisition force who do not currently used price-based acquisition.

There is only one measure for this metric. It is a trend measure that will track the number of proposals submitted for a solicitation against the number of positive responses. The data for this measure can be collected through a required question in the solicitation. The question that will be placed in the solicitation is “Would your company have bid on this solicitation if certified cost or pricing data were required?”.

## **C. METRICS FOR REDUCING ACQUISITION COSTS**

The second goal for price-based acquisition is to reduce acquisition costs. The intent of these performance metrics is to track and evaluate if price-based acquisition is a contributing to a reduction in the associated acquisition costs of a procurement. The three core performance metrics and associated measures that were selected for the measurement of this goal are displayed in Figure 6.2.

### **1. Comparison of Historical Costs**

The first performance metric for this goal is to compare the unit prices of similar commodities using price-based acquisition versus cost-based acquisition adjusted with an inflation index. This metric will take the prices of new contracts that used price-based

acquisition and compare them to historical prices that used cost-based acquisition for similar commodities. The idea behind this metric is to determine if price-based acquisition is able to procure goods and services at reduced prices over cost-based acquisition.

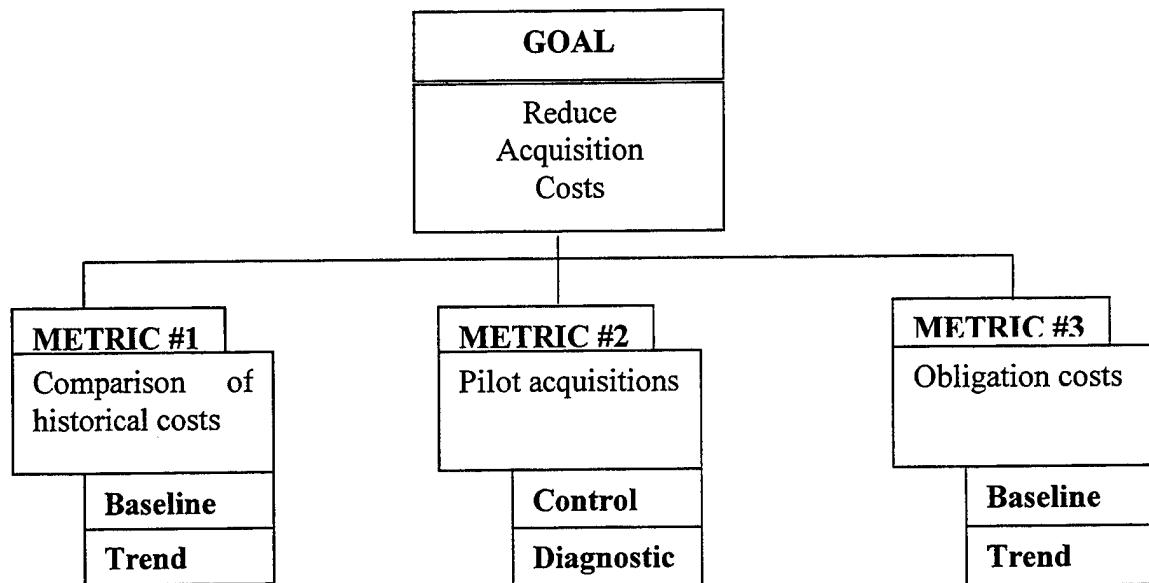


Figure 6.2. Goal of Reducing Acquisition Costs. [Produced by researcher]

A potential problem for this metric is in comparing prices, but not taking into account factors such as quantity differences and the urgency of the procurements.

The baseline measure for this metric will be to track the historical prices categorized by commodities. Either the new or old contract prices will have to be factored against a chosen inflation index, such as the Producer's Price Index, so that the comparison of the two prices take into account the differences of inflation over time.

The second measure for this metric is a trend measure. The purpose of this measure is to track the prices of procurements that have used price-based acquisition against the baseline numbers of similar commodities. This should give a contracting

organization an estimation of whether or not the use of price-based acquisition in similar procurements is able to provide the customer with the desired goods or services at a reduced price.

## **2. Pilot Acquisitions**

The next metric for this goal is to compare the actual price of a procurement using price-based acquisition against an independent cost estimate. This particular metric is a short term metric in relation to the other metrics that are being presented. This metric will be used on a selected set of acquisitions in each Service. A possible problem with this metric could be the independent cost estimate, since it should take into account not only the cost to produce the item, but also its value to the user and the market forces. However, DoD can still gain valuable management information from this metric through the lessons learned from each acquisition to determine how effective price-based acquisition was for this selected test set.

The first measure for this metric is a control measure. The independent cost estimates for each of the acquisitions will be the control limits that the pilot acquisitions will be attempting to stay within.

The second part of this metric will be a diagnostic measure. If one of the pilot acquisitions exceeds the independent estimate, then DoD will be able to take the lessons learned from the acquisition and review the process to determine if the reason was due to the price-based acquisition strategy or another factor.

## **3. Obligation Costs**

The final core performance metric for this goal is to compare how much it costs a contracting office to spend one dollar of their customer's funds between the two

contracting strategies of price-based acquisition and cost-based acquisition. This metric should be a good measure of the costs incurred by a contracting organization in using these two acquisition strategies. The metric should be tracked for each month of the fiscal year. This will require organizations to track labor and non-labor costs of both contracting methods. This may require some organizations to modify their current accounting systems. In addition, this may increase the administrative burden on the acquisition professionals since they will have to keep close account of their costs for the two acquisition methods. There are two performance measures associated with this metric.

The baseline measure for this metric will be to track the obligation costs for procurements that use cost-based acquisition on a monthly basis.

The trend measure for this metric will be to track the obligation costs for the price-based acquisition and then compare them to the obligation costs of cost-based acquisition. These two obligation rates can be combined to provide the contracting organization their overall obligation costs for all procurements.

#### **D. METRICS FOR REDUCING THE ACQUISITION CYCLE TIME**

The third goal of price-based acquisition is to reduce acquisition cycle time. The intent of the performance metrics for this goal is to determine if price-based acquisition is reducing the time that it takes a contracting organization to provide the required goods and services to their customers. There are two performance metrics that are associated with this goal which are displayed in Figure 6.3.

## **1. Administrative Lead Time**

The first performance metric for this goal is to track the average administrative lead-time of procurements that use price-based acquisition. The intent of this metric is to determine if procurements that use price-based acquisition are faster to get on contract than those that use cost-based acquisition for similar commodities. Administrative lead-time would be the receipt of a valid requirement to the time when the requirement was placed on contract.

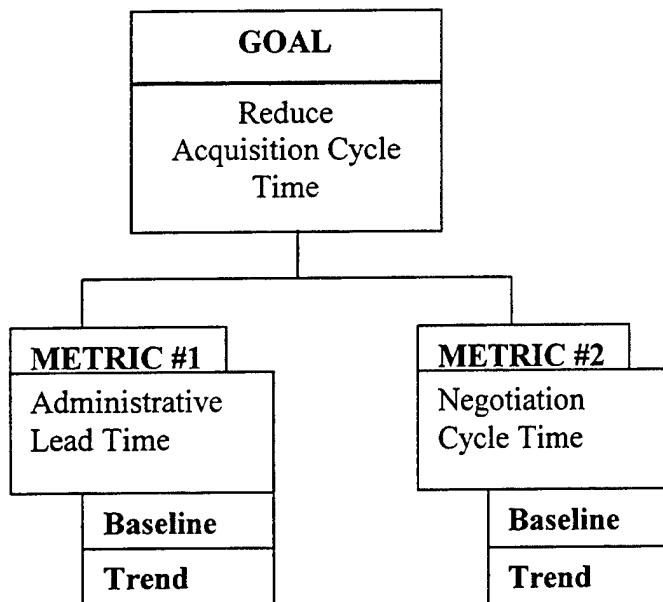


Figure 6.3. Goal of Reducing Acquisition Cycle Time. [Produced by Researcher]

This metric should provide a contracting organization a good measure for monitoring the goal of reducing acquisition cycle time because the contracting organization can directly influence the outcome of this performance metric.

The baseline measure for this metric is to track the average administrative lead-time for procurements that use cost-based acquisition. The baseline measure should be categorized by commodity so different comparisons can be accomplished.

The trend measure for this metric will be to track the administrative lead-time for procurements that use price-based acquisition by commodity. This will allow a contracting organization to compare and examine the lead times of similar commodities. Each of the commodity administrative lead times can be combined to provide the overall administrative lead times for both contracting strategies, but also for the contracting organization as a whole.

## **2. Negotiation Cycle Time**

The second performance metric for this goal is to track the length of negotiations using price-based acquisition against cost-based acquisition of similar commodities. The intent of this metric is to determine if the use of price-based acquisition allows a contracting officer to spend less time in negotiations. The length of a negotiation has a direct impact on the acquisition cycle time of a procurement. This metric will provide the average negotiation times for both price-based acquisition and cost-based acquisition.

The baseline measure for this metric is to track the average negotiation time of procurements that use a cost-based acquisition strategy by commodities. By dividing the negotiation time by commodity it will allow the contracting organization to conduct a better comparison of the two methods.

The trend measure for this performance metric will be to track the negotiation times by commodity that use price-based acquisition. By examining the trend of this measure over time it will allow a contracting organization to determine if their organization is becoming more comfortable with using price analysis as part of price-based acquisition in their negotiations.

## **E. METRICS FOR INCREASING ACCESS TO TECHNOLOGY**

The last goal for price-based acquisition is to increase DoD's access to technology. Even though this is one of the more important goals of price-based acquisition for DoD, it is also the hardest of the four goals to measure. Only one performance metric was selected for this goal, which is displayed in Figure 6.4.

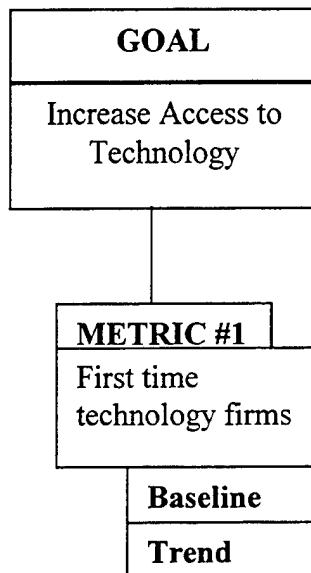


Figure 6.4. Goal of Increasing Access to Technology. [Produced by researcher]

The intent of this performance metric is to track the number of new commercial technology firms in areas such as computer hardware and electronics that are conducting business with DoD for the first time. This metric will use some of the same data as the second metric for the first goal. These data will be tailored only to include those industries that a contracting organization needs for their technological requirements.

The baseline measure for this metric will be to subdivide and track each of a contracting organization's designated high technology firms with which they currently conduct business. The problem with this measure will be keeping the database current.

The trend measure for this metric will be to track the number of new firms that are in the designated high technology industries that are conducting business with the organization for the first time. The collection process for these data will be to use the same question as the previous metric.

#### F. PERFORMANCE MEASURES

In analyzing the performance measures that make up the metrics for the measurement of the goals for price-based acquisition, it becomes apparent that baseline and trend measures are the easier measures to develop for a new acquisition reform, while control and diagnostic measures will generally come later as data are collected.

Figure 6.5 shows the frequency of the four measures for each of the goals.

| Performance Measures | Increase Competition                | Reduce Acquisition Costs | Reduce Acquisition Cycle Time | Increase Access to Technology |
|----------------------|-------------------------------------|--------------------------|-------------------------------|-------------------------------|
| Baseline             | Metric #2                           | Metric #1<br>Metric #3   | Metric #1<br>Metric #2        | Metric #1                     |
| Trend                | Metric #1<br>Metric #2<br>Metric #3 | Metric #1<br>Metric #3   | Metric #1<br>Metric #2        | Metric #1                     |
| Control              |                                     | Metric #2                |                               |                               |
| Diagnostic           | Metric #1                           | Metric #2                |                               |                               |

Figure 6.5. Price-Based Acquisition Performance Measures [Produced by researcher]

The baseline measures for these metrics generally consist of data from procurements that previously used a cost-based acquisition strategy or other data that a contracting organization can accumulate. In establishing baseline measures from cost-based acquisitions, it gives a contracting organization the starting point from which to measure the effects of price-based acquisition on new procurements employing this contracting strategy.

The trend measures for these performance metrics are the data that are being tracked and evaluated. By comparing the trend measures to the baseline measures that a contracting organization has established they will be able to determine if the goals for price-based acquisition are being accomplished.

Generally a control measure will be a goal or limit that a contracting organization will set as something that they want to achieve in relation to that particular performance metric. A control measure can be a percentage reduction in a task or a limit that the contracting activity does not want to exceed. Control measures will generally be initiated after some data have been accumulated and examined so that a range can be established. This does not always have to be the case if an organization can determine a control measure through use of historical data of a similar nature.

The diagnostic measures for these performance metrics generally consist of the trend and control measures once they are established. The trend and control measures will act as the diagnostic measure for a performance metric by isolating the particular item. If a control measure has been established for obligation costs and the obligation costs are tracked by commodity, and if the trend for this metric begins to raise, the trend measure can be broken down to determine if a particular commodity is responsible for the change in the trend.

## **G. SUMMARY**

In order for DoD to know if their goals are being met through the use of acquisition reforms, they need to be able to measure the results of the new practices. The establishment of a set of metrics for price-based acquisition is a necessary dimension for a contracting organization to be able to determine if they are meeting the goals that have

been set. These metrics also allow the contracting organization to track the improvements in the acquisition process and the services that they provide to their customers. It is through the development of metrics that management will get a chance to closely examine the goals that they have set for the organization. It is through this process of developing the metrics that the goals are communicated to the organization, which must implement the use of price-based acquisition to improve the acquisition process. The results from the performance measurements must be used to effect desired acquisition reform management initiatives.

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## **VI. CONCLUSIONS AND RECOMMENDATIONS**

### **A. INTRODUCTION**

As the Department of Defense presses forward with their Revolution in Military and Business Affairs, acquisition reform continues to be a major emphasis. As Dr. Gansler, Under Secretary of Defense for Acquisition, Technology and Logistics has stated, “We (the Department of Defense) must aggressively pursue and fully implement the acquisition reform initiatives of the past few years; and add to these where appropriate.” [Ref 19] A major part of DoD’s current acquisition reform is to more closely align DoD’s current buying practices to those of the commercial sector. A key step toward adopting commercial practices in DoD’s procurement practices has been the renewed emphasis on using price-based acquisition in the acquisition strategy in all types of goods and services. This shift away from requiring certified cost or pricing data to validate the costs of requirements, to relying upon market forces has raised some concerns over the effectiveness of assuring that a fair and reasonable price is paid for items other than commercial items bought in a competitive market.

In order to answer the primary question of this thesis, “What principal metrics should be used to evaluate the effectiveness of price-based acquisition and how might these metrics be applied?” a literature review and interviews with acquisition professionals in each of the Services were conducted. Throughout the course of the literature review and interviews the researcher gathered information on how price-based acquisition was viewed by the acquisition workforce and what goals should be measured

through the use of performance metrics to evaluate the effectiveness of price-based acquisition.

The purpose of this chapter is to outline the data gathered from the research and provide brief answers to the primary and secondary questions posed in this thesis. The literature review provided a foundation from which the questions were developed for the interviews with members of the acquisition workforce. The responses from the policy level and working level interviews provided a wide and varied understanding and use of price-based acquisition throughout the Department of Defense. The following conclusions and recommendations are presented for the conclusion of this thesis.

## B. CONCLUSIONS

- **There is no consistent working definition of price-based acquisition among the Services or within the Department of Defense.** Based upon the information gathered during the survey process of the acquisition professionals throughout the Department of Defense, the researcher has concluded that there is no a clear working definition of price-based acquisition that the workforce can use to implement price-based acquisition in their day to day business. If DoD is to take advantage of price-based acquisition in the contracting process then a consistent understanding of price-based acquisition needs to be agreed upon and disseminated.
- **The acquisition workforce at both the policy and working level tend to associate price-based acquisition with the procurement of commercial items in a competitive market.** From the policy and working level responses both groups generally use price-based acquisition for procuring only commercial goods and services in a competitive market. However there were some responses that used price-based acquisition for procurements outside of the traditional competitive commercial markets.
- **Training needs to be conducted throughout the Services that explains what price-based acquisition is and how it might be applied.** There is a broad and varied understanding of price-based acquisition and the potential areas in which PBA can be used. Some procurement personnel have a sound understanding of price-based acquisition and how to use it to DoD's greatest benefit. The majority of the procurement personnel have only a basic understanding of price-based acquisition and only look to use

- it to procure commercial items when there are many competitors in the market. They do not look at price-based acquisition as an acquisition strategy that can be used for procurement of goods and services that range from complex to non-complex with either multiple sellers or only one seller.
- **The majority of DoD's acquisition workforce is not taking full advantage of transitioning to the use of price-based acquisition to procure goods and services for other than commercial items in competitive markets.** As shown by the majority of the responses from the surveys, many of the acquisition professionals use price-based acquisition only for the procurement of commercial goods and services in competitive markets. Most of the contracting officers do not look at price-based acquisition as a procurement strategy that can be employed for many different types of goods and services depending upon technical risk, cost factors, competition and complexity of the item, but the lack of any one of these items does not limit the use of price-based acquisition if the overall risk can be mitigated through other factors.
  - **The acquisition process lacks goals and a working set of metrics to measure the effectiveness of price-based acquisition.** In all of the responses that were received during the research of this thesis, not one buying organization is currently using a set of performance metrics that specifically measure the performance of price-based acquisition. Without a set of performance metrics geared to price-based acquisition, DoD and the Services will not be able to determine if this acquisition reform is achieving the goals that have been set forth.

## C. RECOMMENDATIONS

The following recommendations are designed to advance DoD's acquisition reform efforts to use price-based acquisition.

- **Establish a sound working definition of price-based acquisition that will be used to train the acquisition workforce throughout the Services.** In order for the Services to gain the advantages from using price-based acquisition, there needs to be a consistent working definition that is used throughout the Services. This working definition should be included in the training programs for the acquisition workforce. The researcher recommends that the working definition from this research be used as the working definition to train the acquisition workforce.

"Price-based acquisition is a contracting strategy that mitigates risk through price and/or cost analysis that does not use certified cost or

pricing data to determine a fair and reasonable price in the procurement of goods and services for the Department of Defense.”

- **Identify a set of acquisitions from each Service that will be used as pilots for price-based acquisition that have traditionally used cost-based acquisition.** Once selected, compare price, cycle time and quality of acquisitions using price-based acquisition and cost-base acquisition. The metric will be to compare the actual price for each of these pilot acquisitions to a pre-award independent estimate. Finally, produce lessons learned from each pilot program to be sent to all of the contracting organizations. This recommendation was presented during several of the interviews and was one of the recommendations made in the Price-Based Acquisition Report [Ref 3:p. 134] This recommendation should be implemented by DoD and the Services. Each Service should select several contracting organizations within their Service to conduct a couple of pilot acquisitions that used cost-based acquisition previously. These acquisitions should be for complex items that have different levels of risk and competition. Independent cost estimates should be done for each acquisition by a source outside the buying activity like the Defense Contract Audit Agency or the General Accounting Office that will be used to compare the actual price of the acquisition against the estimate as one of the measurements to determine the effectiveness of price-based acquisition. A set of metrics should be used to measure the effectiveness of the acquisitions and at the conclusion of each acquisition the buying organization should publish a set of lessons learned that would be posted on the Acquisition Reform website for everyone’s education.
- **Resist initiatives to reverse advances achieved through acquisition reforms.** As new acquisition reforms and ideas are put to use by the acquisition workforce the oversight organizations, such as the General Accounting Office and the DoD Inspector General, will begin to conduct their reviews of the new practices. However, it needs to be understood that mistakes are going to be made and that lessons will need to be learned to effectively use the new acquisition reforms like price-based acquisition. Allow the acquisition workforce to learn from their mistakes. The policy makers in Congress and in the Office of the Secretary of Defense must resist initiatives that would enact rules and requirements that will restrict the advantages of acquisition reforms before they have the opportunity to be fully enacted. It is through these new acquisition reforms that DoD can adopt commercial practices and reduce the restrictive practices of the Government that will entice new firms into providing goods and services to DoD.
- **Continue initiatives that will train the workforce in the understanding and potential uses of price-based acquisition.** With the varied understanding of price-based acquisition and its uses at the policy and

working levels of the acquisition workforce, it is important that training be continued and improved. The Department of Defense has made the commitment to train its procurement professionals through the Defense Acquisition Workforce Improvement Act, which established training requirements for professionals working within acquisition. There are several training opportunities through a variety of institutions like the Defense Acquisition University, Naval Postgraduate School and others that can offer the training on the uses of price-based acquisition. These courses are fundamental to ensuring that the acquisition workforce has the necessary skills with which to implement the new acquisition reforms such as price-based acquisition and to take full advantage of these opportunities.

- **The training courses should incorporate a working definition and potential applications for price-based acquisition along with instruction on price analysis and commercial pricing strategies.** Training of the acquisition workforce needs to be conducted that presents a sound working definition along with an in-depth look at what factors should be examined when deciding upon when to use price-based acquisition. The training should review procurements that range from simple commercial items to DoD unique items that have successfully used PBA. The training should also focus on the skills that a contracting officer would require to effectively use price-based acquisition like the ability to use price analysis and the types of pricing strategies that a firm might use to determine their negotiation position for an acquisition.

#### D. SUMMARY OF RESEARCH QUESTIONS

In order to accomplish the objectives of this study, the following research questions were developed and investigated:

- **Secondary Research Question #1: What is price-based acquisition?**  
Price-based acquisition is a contracting tool that analyzes the various aspects of an acquisition such as the purpose of the acquisition, technical risk, degree of competition, and what pricing data are available. Price-based acquisition uses the available cost and pricing data to determine a fair and reasonable price based on either price or cost analysis, or a combination of the two. Price-based acquisition allows the market place to determine the prices of goods and services that the Department of Defense buys without requiring a company to submit certified cost or pricing data to determine a price.
- **Secondary Research Question #2: What are the essential elements of price-based acquisition that should be measured?**

Currently there is not a core set of goals or essential elements that are agreed upon by the acquisition community for price-based acquisition. This is documented by the varied responses to the survey by the acquisition workforce. From the responses and research completed for this thesis, the following essential elements or goals of price-based acquisition that should be pursued are: increase competition, reduce acquisition costs, reduce cycle time reduction and increase access to technology.

- **Secondary Research Question #3: Can appropriate metrics for evaluating price-based acquisition be identified?**

From the research done for this thesis, an appropriate set of performance metrics for evaluating price-based acquisition can be identified. In taking the data from the literature search and the responses from the survey, numerous metrics can be used to evaluate price-based acquisition. This research has created a core set of metrics, which have been subdivided by the goals that they are to monitor.

- **Secondary Research Question #4: How might these metrics be applied to price-based acquisition?**

First, the performance metrics will be used to monitor and evaluate the progress of price-based acquisition in achieving the stated goals for this acquisition reform. Second, the objectives of each performance metric will assist in developing the strategies that an organization will use to drive towards the achievement of the goals for price-based acquisition.

- **Secondary Research Question #5: How might the application of these principal metrics assist in the enhancement of a price-based acquisition strategy?**

After deciding upon the main goals that are to be accomplished through the use of price-based acquisition, a set of principal metrics need to be implemented at each of the contracting organizations to measure and evaluate the goals to determine if price-based acquisition is accomplishing what it has set out to do. A principal set of metrics allows the acquisition workforce to know what goals are being tracked and are important to the success of this particular acquisition reform.

- **Secondary Research Question #6: Can a set of core performance metrics capture these performance indicators?**

From the literature review and the interviews that were conducted, a list of possible performance metrics was compiled from the research. This list of proposed performance metrics were used to create a core set of performance metrics that relate back to the four individual goals that were decided upon in the thesis. It is the belief of the researcher that these performance metrics will assist DoD and the contracting organizations in

starting to specifically measure the performance of price-based acquisition.

- **Secondary Research Question #7: Can metrics be linked to performance improvement outcomes?**

Performance metrics are used by leading commercial companies and the Government to measure various items that are deemed important to their success by the organizations. While this research did not find any specific metrics being used to measure price-based acquisition, there were many instances of contracting organizations in all of the Services using performance metrics to improve their performance and achieve their goals. All of these organizations believe that the performance metrics that they are using are helping them improve their performance. On the commercial side, if companies were not receiving a measurable benefit they would not use performance metrics to evaluate their progress in achieving their goals.

- **Primary Research Question: What principal metrics can be used to evaluate the effectiveness of price-based acquisition and how might these metrics be applied?**

The principal metrics for price-based acquisition that were found by this research are related back to the four goals that were developed in this thesis. The performance metrics for increasing competition are tracking the number of times that contracting officers require the use of certified cost or pricing data when the requirements of FAR Part 15 are met. The second performance metric tracks the number of first time firms doing business with DoD and the third metric was to track whether PBA was the reason for a firm bidding upon a solicitation.

There are three metrics associated with the goal of reducing acquisition costs. The first metric is to compare the historical unit prices of similar commodities using price-based acquisition versus cost-based acquisition against an inflation index. The second metric is to compare the actual price of a pilot procurement using price-based acquisition against an independent cost estimate in each of the Services. The third metric for this goal is to compare the costs to obligate funds against each type of acquisition.

There are two performance metrics associated with the goal of reducing the acquisition cycle time. The first metric is to track the administrative lead-time of procurements of both acquisition types of similar commodities. The next metric is to track the length of negotiations using price-based acquisition and cost-based acquisition of similar commodities in order to run a comparison of the two acquisition methods.

The performance metric associated with the fourth goal of increasing DoD's access to commercial technology is to track the number of new technology firms that begin conducting business with the contracting organization.

These performance metrics will allow a contracting organization to start measuring the effectiveness of price-based acquisition on their efforts to procure goods and services for the war fighters in less time and at lower costs. As these metrics are actually used and evaluated they most likely will require modification to effectively monitor the goals of price-based acquisition.

#### **E. AREAS FOR ADDITIONAL RESEARCH**

The following are recommended topics for additional research:

- Examine the industry view of price-based acquisition and how it should be applied to the Department of Defense's acquisition process
- How does industry think the use of price-based acquisition should be measured in relation to the Department of Defense's acquisition process?
- Pick a contracting organization and review their metrics and how they are using them against the model presented in this thesis. If the contracting organization does not have any metrics for price-based acquisition then create a set for their use.
- Benchmark performance metrics for price-based acquisition from industry.

## **APPENDIX A. LIST OF INTERVIEWS WITH ACQUISITION PROFESSIONALS**

1. Barnhart, Robert T., Deputy Director of Contracting, Naval Inventory Control Point, Mechanicsburg, Pennsylvania, 15 September 2000.
2. Brennan, James J., Contracts Division Chief for Aviation Engine Spares and Repair, Naval Inventory Control Point, Philadelphia, Pennsylvania, 6 September 2000.
3. Chase, Peter, Director of Policy and Resources, Office of the Assistant Secretary of the Navy (Research, Development and Acquisition), Washington, D.C., 8 September 2000.
4. Cosfol, Chris, Chief of General Industrial Contract Support Division, Defense Supply Center Philadelphia, Philadelphia, Pennsylvania, 17 October 2000.
5. Cunningham, Tony, Defense Contract Audit Agency Liaison, U. S. Army Communications Electronics Command, Monmouth, New Jersey, 8 September 2000.
6. Daum, Joseph R., Procurement Analyst, Special Operations Command, 18 September 2000.
7. Dollase, Steve, CDR, SC, USN, Director Contracting Department (023), Naval Inventory Control Point, Philadelphia, Pennsylvania, 14 September 2000.
8. Dyer, Vicki, Procurement Analyst, Fleet Industrial Supply Center, San Diego, California, 31 October 2000.
9. Elgart, Edward G., Acting Deputy Assistant Secretary of the Army (Procurement), Office of the Assistant Secretary of the Army for Acquisition, Logistics and Technology, Washington, D.C., 24 August 2000.
10. Escalera, Jo, Contracting Officer, Fleet Industrial Supply Center, San Diego, California, 18 October 2000.
11. Facini, Steve G., Contracting Officer for Standoff Weapons, Naval Air Systems Command, Pautexant River, Maryland, 22 August 2000.
12. Florip, Tom F., Deputy Assistant Commander for Contracts, Naval Air Systems Command, Pautexant River, Maryland, 28 August 2000.

13. Gilligan, Deborah J., Senior Contract Specialist, U. S. Army Communications Electronics Command, Monmouth, New Jersey, 8 September 2000.
14. Gleason, James, Procurement Analyst, Air Force Materiel Command, Dayton, Ohio, 11 September 2000.
15. Hanel, Edward, General Counsel, Office of General Counsel at the Naval Regional Contracting Command detachment London, London, England, 5 September 2000.
16. Havrilla, John L., Chief Contracts Pricing Branch, Air Logistics Center-Warner Robbins, Georgia, 30 October 2000.
17. Hersch, Johanna T., Procurement Analyst, U. S. Army Communications Electronics Command, Monmouth, New Jersey, 8 September 2000.
18. Hertling, Virgil, Contract Price Analyst, Air Force Materiel Command, Dayton, Ohio, 14 September 2000.
19. Hudgens, Jim, Customer Support Division Head (Code 204), Fleet Industrial Support Center, Norfolk, Virginia, 18 September 2000.
20. Ijames, Ruth, Chief of Contracting, Sacramento District, U. S. Army Corp of Engineers, Sacramento, California, 21 September 2000.
21. Jaggard, Michael F., Capt, SC, USN, Executive Director for Acquisition and Business Management, Office of the Assistant Secretary of the Navy (Research, Development and Acquisition), Washington, D.C., 8 September 2000.
22. Jenkins, Gwilym, RADM, SC, USN, Deputy of Acquisition and Business Management, Office of the Assistant Secretary of the Navy (Research, Development and Acquisition), Washington, D.C., 8 September 2000.
23. Juric, Ivan A., Defense Contract Audit Agency Financial Advisor, Naval Air Systems Command, Pautexant River, Maryland, 7 September 2000.
24. Lower, Ron, Defense Contract Audit Agency Financial Advisor, Air Logistics Center Ogden, Ogden, Utah, 11 September 2000.
25. Martinelli, Rick, Procurement Analyst, Naval Supply Systems Command, Mechanicsburg, Pennsylvania, 18 September 2000.
26. Meyer, Thomas, Deputy Director of Tank-Automotive and Armaments Command, Tank-Automotive and Armaments Command, Detroit, Michigan, 8 September 2000.

27. Rumbaugh, Kenneth E., Chief of the Small Craft, Auxiliary Vessels and Post Award Team, Defense Supply Center Columbus, Columbus, Ohio, 5 September 2000.
28. Runyan, Joyce L., Senior Procurement Analyst for the Deputy of Acquisition and Business Management to the Policy and Resources Division, Office of the Assistant Secretary of the Navy (Research, Development and Acquisition), Washington, D.C., 8 September 2000.
29. Soloway, Stan Z., Deputy Under Secretary of Defense (Acquisition Reform), Under Secretary for Acquisition, Logistics and Technology, Washington, D.C., 31 August 2000.
30. Sousa, Joe, Procurement Analyst, Space and Naval Warfare Systems Command, San Diego, California, 1 September 2000.
31. Stussie, William, Deputy Assistant Secretary of the Navy for Air Programs, Office of the Assistant Secretary of the Navy (Research, Development and Acquisition), Washington, D.C., 14 September 2000.
32. Walton, Rosalinda, Regional Support Division Head (Code 203), Fleet Industrial Supply Center, Norfolk, Virginia, 18 September 2000.
33. Van Houten, William, Supervisory Contracting Officer, Naval Sea Systems Command, Washington, D.C., 16 October 2000.

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## **APPENDIX B. POLICY LEVEL QUESTIONS**

1. How do you define price-based acquisition?
2. What goals do you see being accomplished through the use of PBA?
3. What areas or applications do you see PBA being useful in?
4. What areas of PBA should be measured?
5. What metrics would you suggest be used to measure PBA?
6. What are your thoughts on the acquisition continuum?

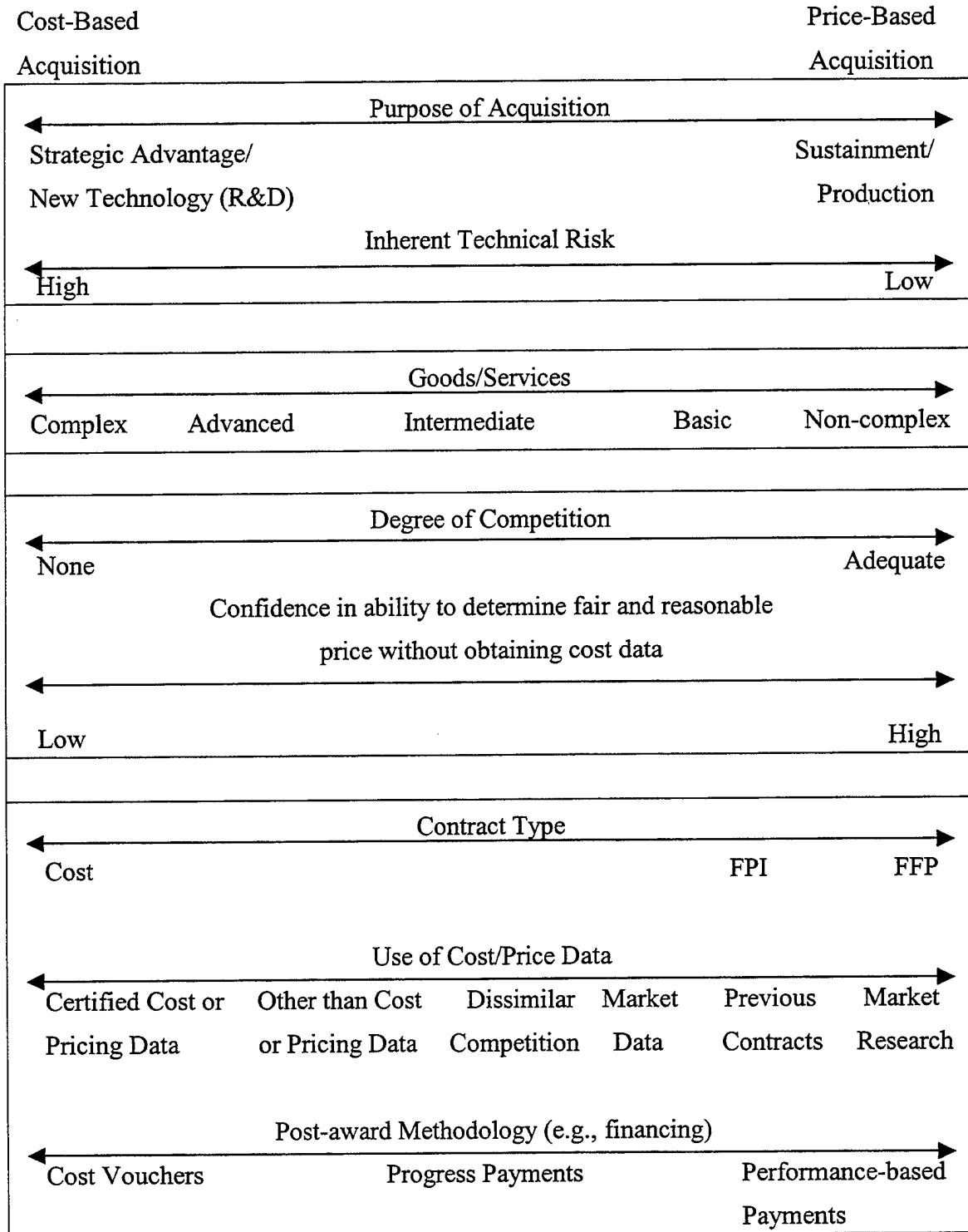
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## **APPENDIX C. WORKING LEVEL QUESTIONS**

1. How do you define price-based acquisition?
2. What types of acquisitions have you used PBA on?
3. What areas of PBA should be measured to judge the effectiveness of PBA?
4. Do you currently use any metrics to measure PBA?
5. What metrics would you suggest be used to measure PBA?
6. What are your thoughts on the acquisition continuum?

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## APPENDIX D. ACQUISITION CONTINUUM



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2. *Price-Based Acquisition Report*, December 1999.
3. "USD(A&T) Sets Goals for Total Ownership Cost." [http://www.acq-ref.navy.mil/newsletters/9901v6n1.html]. October 2000.
4. Arthur Anderson Government Services, *Office of the Secretary of Defense/Industry Price-Based Acquisition Roundtable, Executive Report*, 1999.
5. Dobler, Donald W., and Burt, David, N., *Purchasing and Supply Management*, 6<sup>th</sup> ed., McGraw-Hill Companies, 1996.
6. "Federal Acquisition Regulation, Part 17." [http://web2.deskbook.osd.mil/reflib/MFAR/017KA/017KAdoc.htm]. April 2000.
7. Pindyck, Robert S., and Rubinfeld, Daniel L., *Microeconomics*, 5<sup>th</sup> ed., Prentice Hall, 1998.
8. *Contract Pricing Reference Guide*, Volume I, "Price Analysis," Air Force Institute of Technology and Federal Acquisition Institute, FAC 90-38.
9. Nagle, Thomas T., and Holden, Reed K., *The Strategy and Tactics of Pricing*, 2<sup>nd</sup> ed., Prentice Hall, 1995.
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11. *Contract Pricing Reference Guide*, Volume III, "Cost Analysis," Air Force Institute of Technology and Federal Acquisition Institute, FAC 90-38.
12. Brown, Mark Graham, *Keeping Score*, Quality Resources, 1996.
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14. [www.dictionary.com/definition]
15. Defense Logistics Agency, *DCMC Metrics Guidebook: Charting the Course*, 1997.

16. Harbour, Jerry L., *The Basics of Performance Measurement*, Quality Resources, 1997.
17. Hernandez, Richard J., and Ferguson, Kevin W., "Best Practices in Environmental Contracting," *Topical Issues in Procurement Series*, v. 7, iss. 11, November 1996.
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